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BRITISH
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MUSEUM

Tho. Dilworth,
Schoolmaster.

Miſcellaneous Arithmetic:

OR A FULL

Account of the New Calendar;

With the ſeveral

Uses of the LOGARITHMS,

AND OF

Multiplication and Diviſion by Mony, &c.

In Seven Parts.

CONTAINING,

I. A brief Account of the Feſtivals and Faſts of the *Jewiſh* and *Chriſtian* Churches; with ſuch others as are mentioned in the preſent new Calendar; very neceſſary for the better underſtanding the ſaid Calendar.

II. A Diſſertation concerning Years, Months, &c. and the manner of their being ſettled in the World, for the better Computation of Time. Together with the Calculation of Scripture-Meaſures, Weights, and Coins: and an Obſervation concerning the exquiſite Workmanſhip of the Tabernacle, &c. in the Time of *Moſes*.

III. Rules for finding the Golden Number, Epact, &c. together with the Method of calculating *Eaſter*, and all the other moveable Feaſts throughout the Year: All which ſerve for a further Underſtanding of the preſent new Calendar.

IV. The Uſes of the Logarithms; ſhewing how to perform that Sort of Arithmetic in all its Parts, whether in whole Numbers, or in Fractions; with the Method of adding and ſubtracting Indices, both affirmative and negative.

V. The Method of performing Multiplication and Diviſion of Pounds, Shillings and Pence, by Pounds, Shillings and Pence, ſo as it may anſwer the Purpoſes of performing an Operation in the Rule of Three, where the Terms are compoſed of Mony only; or in Fellowſhip, where the Terms are compoſed of Mony and Time, by which it appears, that this Sort of Arithmetic is very curious, and perhaps not altogether uſeleſs.

VI. Some Obſervations on the Weather; by which any Perſon is enabled to form to himſelf ſome Ideas of it for the Time to come; to which is ſubjoined, a Taſte of Enigmatical Writing, together with the Character of a good Chriſtian, ſet forth in twenty Paradoxes, with their Solutions.

VII. An Eſſay concerning the Education of Children, ſo far as relates to the ſeveral Sciences which they are to learn at School.

The Whole, being the fulleſt and compleateſt of this Kind extant, is deſigned for the Uſe of Schools in *Great Britain* and *Ireland*; and in the *Engliſh* Plantations and Colonies, as Subjects both profitable and entertaining.

By THOMAS DILWORTH,

Author of the *New Guide to the Engliſh Tongue*, *Schoolmaſters Aſſiſtant*, *Young Book-keeper's Aſſiſtant*, &c. &c. and Schoolmaſter in *Wapping*.

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BRITISH MUSEUM

TO THE SEVERAL

LADIES and GENTLEMEN,

Who have been committed to the Author's Care, and educated by him.

LADIES and GENTLEMEN!

HAVING inſtructed you, among other Things, in the Arts of Writing and Accompts, and am ſtill inſtructing ſome of you in the ſame Arts, I hope it will not be deemed a fruitleſs Labour, if I furniſh you with another Help, I mean that of underſtanding our preſent New Calendar, in all its Varieties: A Study as eaſy as it is pleaſant, and equally as neceſſary for a Lady to be acquainted with, as a Gentleman.

Some Things in this Treatiſe, *viz.* the Management of Logarithms, and the Arithmetic of Mony, will not, in all Probability, become the Study of the Fair Sex, and therefore may be adjudged unneceſſary for them to bend their Minds that Way; but the Whole may be learn'd by young Gentlemen, with as much Eaſe as any other Part of Arithmetic.

The following Pages, carefully read over, I am ſure will be both pleaſing and profitable; and therefore the making uſe of your *beſt Endeavours*

 herein,

herein, as well as in all your other Studies, will certainly turn to your Advantage, and afford ſuch Satisfaction of Mind as cannot be purchaſed by careleſs Performances: And if a right Uſe be made of Numbers, it will certainly give you this Information, That all Knowledge therein (Teachers being only the Channels or Pipes of Conveyance) comes from the great Arithmetician of the Univerſe; whom to know and ſerve faithfully, will be your greateſt Advantage; inaſmuch as ſuch an Obedience will, at the laſt, moſt ſurely bring you to the Manſions of an happy Eternity. I am,

LADIES and GENTLEMEN!

Your moſt humble

And moſt obedient Servant,

Thomas Dilworth.

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THE PREFACE.

THE following Pages, containing (in Part) ſeveral Sorts of Arithmetic, *which could not be conveniently join'd to the* Schoolmaſters Aſſiſtant; *it was thought proper to print them by themſelves: Nothing of that kind being taught in our Schools, in the ordinary Way; only among ſome few, the* third *and* fourth Parts, *as they lie in the Road to* Navigation.

The Calendar *and* Logarithmetic, *in every Author, I find ſo ſhort, that a Pupil is hurried through them, before he rightly underſtands them; and the* fifth Part *has never yet been taught in any School at all.*

As to the firſt Part, *containing an Account of the* Feſtivals *and* Faſts *of the* Jewiſh *and* Chriſtian Churches; *it was extracted partly from the Works of Dr.* Sparke, *Chaplain to King* Charles *the Second; partly from Mr.* Nelſon's *Feſtivals and Faſts of the Church of* England, *but chiefly from the Works of Sir* George Wharton, *a Gentleman eminent for his Abilities, both in the Univerſity and in the Army, in the Time of King* Charles *the Firſt; and who ſuffered very much, both in his Perſon and Fortune, for the ſake of his Royal* Maſter, *by the* Regicides, *or their Favourers: And therefore I thought the introducing it into our Schools,* in order to be read there, *might contribute towards the underſtanding the* new Calendar, *as it is prefixed to our Common Prayer-Books: A Subject, though very eaſy and pleaſant, I find many adult Perſons intirely ignorant of. To which I have added, an Account of the other* Feſtivals *and* Faſts, *which are mentioned in the ſaid* Calendar, *whereof three, viz.* January 30th, May 29th, *and* November 5th *(which being merely temporary) are obſerved by the Church of* England *only during the Will of the Legiſlature; together with another on* September 2d, *obſerved in* London *only; and the reſt, (at leaſt ſome of them) by the Church of* Rome, *or ſuch others as are in Communion with that Church.*

The ſecond Part *contains a* Diſſertation *concerning* Years, Months, Weeks, Days, Hours, Minutes *and* Seconds; *and the manner of their being ſettled in the World, for the better Computation of Time; taken in Part from the foremention'd Sir* George Wharton: *Together with* Tables *of* Scripture-Meaſures, Weights *and* Coins; *with an* Appendix, *containing the Method of calculating its* Meaſures *of* Surface, *and reducing them to our own* Meaſures. (*A Work originally begun by the late Lord Biſhop of* Peterborough, *and placed in our large Quarto Bibles*) *in ſeveral Places of which* Appendix, *are placed the Arithmetic of thoſe Calculations, as a further Explanation of that Appendix; to which is ſubjoin'd, an* Obſervation *concerning the exquiſite Workmanſhip of the* Tabernacle, the Ark of the Teſtimony, Mercy-Seat, *&c. in the Time of* Moſes; *all which were directed by God Almighty himſelf, and ſhewn to* Moſes *while he was with God on the Mount. Intended to be read by the Youth of both Sexes at their Schools, in order to give them ſome Ideas of thoſe Meaſures both of* Surface *and* Capacity, *and to exclude contemptible Thoughts of the divine Workmanſhip.*

The third Part, *which contains* Rules *and* Tables *for a further underſtanding the* new Calendar, *is the fulleſt and compleateſt of any thing of that Kind hitherto publiſhed for ſcholaſtic Uſes; and to make it turn to any Advantage, the Pupil ſhould be taught how to make the* Table *for finding the* Golden Numbers, Epacts, Dominical *or* Sunday Letters; *and alſo the moveable* Feaſts *dependant on* Eaſter; *together with the other* Tables *of the* Moon, *containing her* Change, Full, Age *and* Southing; *and what* Year, Month, Day *and* Hour, *theſe will happen on.*

The fourth Part *contains the Uſe of the* Logarithms; *a Sort of Arithmetic firſt invented by Lord* Napier, *Baron of* Merchiſton *in* Scotland, *and is of ſuch Uſe for the facilitating of Calculations in ſeveral Parts of the Mathematics, that it is very well worth the while to be perfectly acquainted with them. And here the Learner will find the largeſt Inſtructions that he can poſſibly deſire, or that are any where to be found. If* Sherwin's *Tables (which I would recommend for ordinary Uſe before any other) were*

join'd

join'd to this Part of the Pupil's Study, I believe it would be found very agreeable. The Addition *and* Subtraction *of* Indices, *I never ſaw in Print before; but as they are uſed both affirmatively and negatively before* Logarithms, *I thought it might not be amiſs, firſt to conſider them in the Light they are there placed, though they may otherwiſe be looked on as the* Coefficients *in* Algebra. *One thing I muſt beg Leave to obſerve, that whereas I have found ſome Authors make uſe of one Sort of* Negative Indices, *and ſome, another Sort, that is, their* Complements *to* 10, *I have in this Treatiſe ſhewn the Uſes of them both; ſo that the Pupil may hereafter uſe either of them, as he likes beſt; and alſo to prevent his being ſurpriſed, when he ſhould at any Time meet with an Author that treats of them one Way, when himſelf has learned them another Way.*

The fifth Part *is a Sort of Arithmetic, which is no where taught that I know of, except in a few idle Queſtions, too often given by Way of Trial of a Boy's Abilities, but have no Foundation in Reaſon; and it was owing to Propoſitions of this Kind, which ſet me at work to try how far this Way of managing broken Numbers could be carried. That it is curious, I think none can deny; how far it is really uſeful, I ſhall leave others to determin. That it holds moſt certainly good, is obvious enough from the ſeveral Operations wrought at Length in the Rule of Three, and proved both by* Whole Numbers, Vulgar Fractions, *and* Decimals: *Not that I am a Friend to what is called* Multiplication of Mony by Mony, *excluſive of* Diviſion *going along with it: For where the* Rule of Three *is not concern'd, it is idle to the laſt Degree; but where it is concern'd, both* Multiplication *and* Diviſion *muſt be firſt learned, that the* fourth Proportional *may be found: And the* Multiplication *of any* two Terms *of different Names in the* Rule of Three of Whole Numbers, *would make as bad a blunder, were not the Product divided by the other Term.*

And as Examples *make up one of the beſt Methods of conveying Inſtructions to, and confirming them in the Pupil, he will here meet with ſuch a competent Number of them,*

throughout all the Parts, *as cannot fail of anſwering the End expected, and of which moſt other Treatiſes are extremely defective.*

The ſixth Part *contains*, Firſt, *ſome Obſervations on the* Weather, *very neceſſary for a Boy of ſome Genius to be acquainted with, which lately made its Appearance in the World in a very unjuſt Manner, by which it appears as if this was copied from that unfair Performance, but in Fact it was ſtolen from my Papers, while they were in* Manuſcript. Secondly, *A Taſte of* Ænigmatical *Writing, containing thirty-three dark, obſcure and intricate* Queſtions *and* Rebuſſes, *with their* Solutions. *And* Thirdly, *the Character of a good* Chriſtian, *ſet forth in twenty* Paradoxes, *each* Paradox *being ſolved in ſo clear a Light, that a Youth of middling Underſtanding may be able to comprehend them: All which ſerve as ſo many Touch-Stones to whet the Genius of thoſe, who are not inclined to be idle; and to help thoſe, who are inquiſitive after Knowledge. And as Studies of theſe Kinds are not to be entered on till the Pupil's Ideas are enlarged by a due Share of reading and ſtudying* Numbers, *I thought it would not be amiſs to give them a Place here, for the Benefit of ſuch induſtrious young Ladies and Gentlemen. To which are ſubjoined a few Queſtions, ſome* Arithmetical, *and others of* Pleaſantry.

The ſeventh *and* laſt Part *contains, as the Title-Page expreſſes it,* An Eſſay concerning the Education of Children, ſo far as relates to the ſeveral Sciences, which they are to learn at School; with a Word or two concerning good Manners in Children, the Circumſtances of their Parents, and School-Prayer. *If the Whole of this Part is read with the ſame Candour that it was wrote, it will never give Offenſe, but on the Contrary have its deſired Succeſs.*

Upon the Whole: If any Inſtructor of Youth has Courage enough to uſe this Treatiſe *in his* School, *as the* Schoolmaſters Aſſiſtant *is uſed; it will ſave him an infinite deal of Trouble, and at the ſame Time will give his Scholars an Opportunity of making four times the Improvement, by having Buſineſs always ready cut out for them; in all which both* Teachers *and* Scholars *will undoubtedly find their* Advantage.

Miſ-

Miſcellaneous Arithmetic:

OR A FULL

ACCOUNT of the NEW CALENDAR, &c.

PART I.

A ſhort ACCOUNT of the FESTIVALS and FASTS OF BOTH THE JEWS and CHRISTIANS, WITH THE Original and End of their INSTITUTION.

IT cannot well be denied, but that as God, by his extraordinary Preſence, hath hallowed and ſanctified certain Places; ſo by his extraordinary Works, he hath worthily advanced certain Times; for which Reaſon they ought to be eſteemed, with all Men, more holy than other Days.

The Times ſo advanced, are the Feſtivals and Faſts of the *Jews* and *Chriſtians*.

I. Of the FESTIVALS and FASTS of the JEWS.

Theſe were of two Sorts, *viz.* Firſt, Thoſe inſtituted by divine Authority. And

Secondly, Thoſe which were inſtituted by the Appointment of Men.

Firſt, Of the *Jewiſh* Feſtivals and Faſts,* inſtituted by divine Authority. Theſe alſo were of ſeveral Sorts,

* Note, *It does not appear any where in Sacred Writ, that God Almighty appointed any* Faſts; *but that the* Jewiſh Faſts *were purely of human Inſtitution.*

1. The *Sabbath*, or ſeventh Day in every Week; which ſignifies a Day, or Time ſet apart for holy Reſt: Which Day God conſecrated to his Worſhip, becauſe thereon he reſted from his Work of Creation, as may be ſeen at large, *Ex.* xx. 9, 10. 11. The Ends whereof, were

(1.) *Eccleſiaſtical*, for the Worſhip of God, and Meditation upon his divine Works.

(2.) *Civil* and *Oeconomical*, for the Eaſe and Refreſhment of their Bodies, whoſe Strength had been exhauſted by Labour. *Six Days thou ſhalt do thy Work; and on the ſeventh Day thou ſhalt reſt; that thine Ox, and thine Aſs may reſt, and the Son of thine Handmaid, and the Stranger may be refreſhed.* Exod. xxiii. 12. *and* Lev. xxiii. 3.

(3.) *Spiritual* (1.) As being a Type of that ſpiritual Reſt, whereby we ſhould ceaſe from the Works of the World, and the Fleſh, that God might work in us by his Word and Spirit. And (2.) As ſhadowing unto us that endleſs Reſt, which all of us hope to enjoy with God in the World to come.

2. The *Neomeniæ*, or Feaſts of New Moons, celebrated the firſt Day of every Month, beginning with the new Moon; *Numb.* xxviii. 11. which were inſtituted in Memory of the Light created by God.

(1.) That his People, by this Means might be alienated from the Superſtitions and Idolatries of the *Ethnics* (who ſubjected the Months to the Planets, Stars, and Celeſtial Signs) and know that God is the only Lord, Governor, and Moderator of the Stars and Signs themſelves, and conſequently of the Months and Years, and Time in general; and therefore give unto God the greater Thanks, who ordained all theſe Things for the Uſe and Benefit of Men.

(2.) To typify Man's Renovation by the Illumination of the Holy Spirit, which is ſtill required of all the Faithful. *Except a Man be born of Water and of the Spirit, he cannot ſee the Kingdom of God.* John iii. 5.

3. The *Paſcha*, or *Paſſover*, which ſignifies a Paſſage or Leap. This was inſtituted *Anno Mundi* 2513, at the Departure of the *Iſraelites* from the Land of *Egypt*; and afterwards during their Abode in the Wilderneſs, celebrated from the fifteenth Day of the firſt Month *Abib* (called afterwards *Niſan*) to the twenty-firſt Day of the ſame Month, incluſively; that is, for ſeven Days together: Yet ſo, as that the firſt and laſt thereof, *viz.* the fifteenth and twenty-firſt, were held more feſtivous, and ſacred than the reſt. Theſe ſeven Days were likewiſe called the Feaſt of *Azymes*: and the firſt of them

them the *Paſcha*, becauſe that thereon the *Paſchal* Lamb was eaten ——

(1.) To call to mind, and as it were, conſecrate to Eternity, God's miraculous Deliverance of the *Iſraelites* from their Bondage in *Egypt*, by the deſtroying Angel's ſmiting the *Egyptians*, and paſſing over the Houſes of the *Iſraelites*.

(2.) For a ſure Teſtimony of the perpetual Mercy and Power he would ſhew to his People. And,

(3.) To typify Chriſt Jeſus, and our Deliverance perfected by him.

4. The Feaſt of *Pentecoſt*, ſo called from the Greek Πεντηκοστη, called alſo by the Hebrews, *Exod.* xxxiv. 22, and *Deut.* xvi. 10, *the Feaſt of Weeks*. But it truly ſignifies the fiftieth (ſolemn and feſtival) Day from the ſecond of the *Azymes*, in which Senſe St. *Luke* takes it, *Acts* ii. 1, *And when the Day of Pentecoſt was fully come*; and *Acts* xx. 16. ſpeaking of St. *Paul*, *For he haſted, if it were poſſible for him, to be at Jeruſalem the Day of Pentecoſt*. By this Name alſo are meant all thoſe fifty Days, betwixt the ſecond of *Azymes*, and the fiftieth feſtival Day. It is alſo called *Feſtum Primitiarum*, the Feaſt of the firſt Fruits, from the firſt Fruits, or the Bread offered which was made of the firſt Fruits. *Exod.* xxiii. 16.

This Feaſt was inſtituted,

(1.) In Memory of the Law given by God on Mount *Sinai*, the fiftieth Day after the *Iſraelites* departed out of *Egypt*.

(2.) That by the ceremonial Oblation of two Loaves made of the new Fruits, to the Lord, Men might be admoniſhed they received all Fruits, and ſo all things elſe for the Preſervation of Life, from the bountiful Hands of God, and be alſo excited to beſeech God, not only for a Bleſſing thereupon, but alſo to make a ſanctified Uſe thereof.

(3.) To typify that *Pentecoſt*, wherein Chriſt, after his Aſcenſion, proclaimed the Law (not that which was written in Tables of Stone, but) in the Heart and Mind, the Law of the new Covenant; that happy Day, on which the firſt Fruits of the Holy Spirit were miraculouſly poured down on the Apoſtles.

5. The Feaſt of *Trumpets*; becauſe on the firſt Day of the ſeventh Month eccleſiaſtical, or firſt political, the Sound or Noiſe of Trumpets or Cornets, were every where heard by the Command of God, *Levit.* xxiii. 24, *In the ſeventh Month, in the firſt Day of the Month, ſhall ye have a Sabbath, a Memorial of blowing of Trumpets, an holy Convocation*. Hence, ſome of the *Jewiſh* Rabbins believed it was ordained in Memory of

Iſaac's

Iſaac's Deliverance from being ſacrificed: And that God commanded a Noiſe ſhould be then made by the Trumpet or Horn of a Ram, becauſe a Ram was caught by his Horns in a Thicket or Buſh, *Gen.* xxii. 13. and ſacrificed in his ſtead. Others have thought it very unlikely, that ſo public and ſolemn a Feaſt ſhould be inſtituted for the Deliverance of a ſingle Perſon, but rather to commemorate thoſe grievous Wars which the *Iſraelites* undertook, firſt againſt the *Amalakites*, and afterwards the *Ethnics*, to the End they might be admoniſhed that this human Life of ours is nothing but a perpetual Warfare upon Earth.

6. Next to the foregoing, and in the tenth Day of the ſame Month, was the Feaſt of *Expiation* or *Atonement* celebrated; *Levit.* xvi. 29, and xxiii. 27. In which annual Solemnity, an univerſal expiatoric or propitiatory Sacrifice was perform'd for the Sins of the People: Whereby the whole Paſſion and Fruits of our Saviour's Death, were yearly ſhadowed out, by the whole Church. Yet the *Jews* ſay, it was inſtituted in Memory of God's Favour to them, in forgiving their Sin of Idolatry, committed by their making a Calf in the Deſert.

7. The Feaſt of *Tabernacles*, celebrated next after the two former, *viz.* from the fifteenth Day of the Month *Thiſri*, to the twenty-firſt Day incluſively, that is, for ſeven Days together; yet ſo, as that the firſt and laſt Days were more ſolemn and feſtivous than the reſt. *Levit.* xxiii. 34, *&c.* The End of which Feaſt, is contained in theſe Words, *That your Generations may know that I made the Children of Iſrael to dwell in Booths, when I brought them out of the Land of Egypt.* Levit. xxiii. 43.

8. Next to this did immediately follow the Feaſt of the *Congregation*, or great and ſolemn Aſſembly, celebrated the twenty-ſecond Day of the ſeventh Month, and called by the Hebrews *Hatiſiph*, alſo *Azereth*, that is, an Aſſembly or Collection: Or ſecondly, a Retention and Prohibition; becauſe that when the ſeven Days of the Feaſt of Tabernacles were expired, the People were obliged to hold it one Day longer: Or thirdly, becauſe upon that Day they were prohibited the doing any Work: Or fourthly, becauſe the People were obliged to contribute Mony for the Uſe of the Sacrifices: Or fifthly, becauſe it ſhadowed out a Collection of all Nations: Or ſixthly, a Gathering together of the Elect in the Kingdom of Heaven: Or laſtly, from the Collection of Fruits, becauſe on the Cloſe of this Day, were offered the *Primitia*

of

of the *Serotine* Fruits, or firſt Fruits of the Evening, and that Thanks were therefore given unto God. Howbeit, it was an Appendix to the Feaſt of Tabernacles, as may be ſeen, *Levit.* xxiii. 36, 39, and *Numb.* xxix. 35.

But here Note, that *Jeroboam*, who revolted with the ten Tribes from *Rehoboam*, the Son of *Solomon*, commanded the precedent Solemnity of *Tabernacles* (which the *Jews* were commanded by God, in the Law, to celebrate in the ſeventh Month) to be kept in the fifteenth Day of the eighth Month; that ſo by little and little, he might wean the Sons of *Iſrael* from the Rites and Cuſtoms of their Fathers, as in 1 *Kings*, xii. 32.

9. The next Feaſt inſtituted by God, was the *Septennial*, or *Sabbatical* Year, which took Beginning from the tenth Day of the ſeventh Month. For as the *Jews* every ſeventh Day, ſo their Land every ſeventh Year kept a Sabbath: The Obſervation whereof conſiſted in theſe two things eſpecially, *viz.*

(1.) That the Ground ſhould lie untilled.

(2.) That Debts ſhould be remitted.

And therefore *Moſes* (*Deut.* xv. 1, 9.) called this Year the Year of *Releaſe*; becauſe that both Agriculture or Tillage, and Debts were this Year commanded by God to be forborn and remitted. *Deut.* xv. 1, 2, and xxxi. 10.

The Cauſes of this Feaſt, were partly Civil, partly Myſtical. *Firſt* Civil, to teach them,

(1.) That they were not by continual Exerciſe to draw out the Strength of the Earth, and thereby make it barren; for, as all other Creatures, ſo likewiſe the Earth, hath need of Intermiſſion and Reſt.

(2.) Gratitude to God for the Fruits of the Earth, and Mercy to the Poor, whereof a principal Regard is had in this Law. And

Secondly Myſtical,

(1.) To remind them of *Adam*'s firſt Eſtate, wherein only the voluntary Fruits of the Earth were fed upon.

(2.) To ſhadow out unto them an eternal Sabbath, that is, a bleſſed Life, in which all the Labours and Miſeries of the preſent Life, together with Exactions of Creditors, ſhall have an End, and the Sins of Believers be remitted.

10. The tenth and laſt of the Feaſts inſtituted by the Command of God, is the Year of *Jubile*, that is, a Year of Rejoicing, or of Remiſſion, celebrated every fiftieth Year; for ſo it is commanded, *Levit.* xxv. 8. *And thou ſhalt number ſeven Sabbaths of Years unto thee, ſeven times ſeven Years; and*

the

the Space of ſeven Sabbaths of Years, ſhall be unto thee forty and nine Years. Therefore the Year following this, was the fiftieth Year, and wholly Sabbatical: From whence, if you account excluſively to another Year of Jubile, you have only forty and nine Years, and ſo it is numbered in the latter Part of the Verſe laſt cited; but if incluſively, that is, if you account both the former and the latter, you ſhall have fifty Years, as at Verſe the 10th of the laſt mentioned Chapter; which manner of Account is often uſed by us at this Day. For thus a Week is ſaid to have eight Days, counting both the *Sundays*; but one of them being excluded, there remains but a true Week, conſiſting of ſeven Days.

In this Year, not only the Bondmen of *Iſrael* were ſet free from their Maſters, and the Priſon Doors thrown open, but all Debts were likewiſe remitted; and the Grounds, Vineyards, Houſes, and other Poſſeſſions return'd to their firſt Owners. For it was not permitted any Man to ſell his Grounds or Houſes to another, by a perpetual Contract; but only the Uſe and Fruits thereof till the Year of Jubile; which may be read at large in the forementioned 25th Chapter of *Leviticus*.

The End of this Feaſt, like the former, was partly *Civil* and partly *Myſtical*.

Firſt, *Civil*.

(1.) Becauſe God therein ſo ordained things, that the Families of the *Iſraelites* ſhould not be deſtroyed, but more eſpecially that Family, out of which the Meſſiah was to come.

(2.) To ſhew unto us what a ſpecial Regard he had, and ſtill has, for the Poor, to put them in Hope of a better Condition for the future, and alſo lay down a Way to brotherly Communion, ſo far forth as the Condition of this Life will permit.

(3.) As the *Olympiads* were in Uſe among the *Greeks*, the *Luſtra* among the ancient *Romans*, and the *Indictions* among the later *Romans*, whereby they ſupputated Time; ſo alſo the *Hebrews* ſhould be accuſtomed to number their Times by Jubiles, ſo ſoon as poſſeſſed of the holy Land.

Secondly, *Myſtical*, To ſhadow out to them, by this public Jubile and ſolemn Joy, the Lord *Jeſus*, and the whole Buſineſs of their Salvation: and this himſelf alluded to, *Luke* iv. 19, where he ſaith, *To preach the acceptable Year of the Lord.*

Secondly, Of the *Jewiſh* Faſts and Feſtivals, done by the Appointment of Men.

1. The

1. The *Jejunia Quatuor*, or four ſolemn Days of Faſting, mentioned in *Zechariah* viii. 19.

(1.) The Faſt of *Jeruſalem beſieged*, which (notwithſtanding it to be the laſt, according to the Order of the Months, yet it) is the firſt in reſpect of the Order of the Thing done. This was celebrated the tenth Day of the tenth Month, on which Day *Nebuchadnezzer* firſt pitched his Tents before, and beſieged *Jeruſalem*, 2 *Kings*, xxv. 1.

(2.) The Faſt of *Jeruſalem taken by Nebuchadnezzer*, celebrated the ninth Day of the fourth Month, *v.* 3.

(3.) The Faſt of *Jeruſalem forſaken*, or made *deſolate*, celebrated the ninth Day of the fifth Month, becauſe that on this Day in this Month, the City and Temple were ſet on fire; firſt by *Nebuzaradan*, Captain of the Guard belonging to *Nebuchadnezzer*, King of *Babylon*, *v.* 9. and after that by *Titus*.

(4.) The Faſt of *Gedaliah*, who was left in *Judea* by *Nebuzaradan*, and ſlain by the Treachery of *Iſhmael*, celebrated the third Day of the ſeventh Month. *Jer.* xli. 2.

Note, *The foregoing four ſolemn* Faſt-Days, *were, by the divine Order, appointed to be Days of* Feaſting *at the Reſtoration of* Jeruſalem, *Zech.* viii. 19.

2. To the foregoing four Faſts (during the Captivity of the *Jews* in *Babylon*) was annexed the ſolemn Faſt of Queen *Eſther*, inſtituted in Memory of the three Days *Faſt* ſhe commanded, when about to apply herſelf to King *Ahaſuerus*, on behalf of the *Jews*, *Eſther* iv. 16, and celebrated the thirteenth Day of the twelfth eccleſiaſtical Month *Adar*, whereon all the *Jews* throughout the Kingdom of *Perſia*, ſhould have been ſlain by the Perſuaſion of *Haman*, *Eſth.* iii. 9. Afterwards this Day became more celebrious for the ſignal Victory of *Judas Maccabeus*, who overthrew the Army of *Antiochus*, with *Nicanor* the Captain of it. 2 *Mac.* chap. ult.

3. The *Jews* likewiſe celebrated of old, the Faſt of the *Tables of the Law broken* (which *Moſes*, when deſcending from Mount *Sinai*, daſhed againſt the Ground, and broke in Pieces, as being offended at their Idolatry of worſhiping the Calf) the ſeventeenth Day of the fourth Month *Tamuz*.

4. The Days of *Purim*, or Feaſt of *Lots*, ſo called, becauſe *Haman* had caſt the Life and Death, as it were, of the *Jews*, upon the Hazard of a *Lot*; which Feaſt was firſt celebrated by *Mordecai* and *Eſther*, the fourteenth and fifteenth Days of the laſt Month *Adar*, in Memory of the Lord's moſt wonderful Protection, when *Haman* had laid his inevitable Plot, to Man's thinking, for the utter Extirpation of the *Jews*, even in one Day. *Eſth.* iii. 13.

5. The

5. The Feaſt of *Comportion of Wood*, mentioned by *Joſephus*, Book 2, of the Wars of the *Jews*, Chap. 17, celebrated in the fifth eccleſiaſtical Month *Ab*, in Memory of the Wood comported, or brought for perpetual Nouriſhment of the Holy Fire in the Temple of *Jeruſalem*, according to the Law of God. *Nehem.* x. 34.

6. The *Encænia*, or Feaſt of Dedication, or Conſecration and Renovation of the Temple, inſtituted by *Judas Maccabeus*. For when *Antiochus Epiphanes* came out of *Egypt* into the Holy Land, and ſo to the Temple, he reduced both the City and Temple; everted the true Worſhip of God; carried away the Veſſels of the Temple, and therein placed the Idol of *Jupiter Olympius*, as you may read 1 *Mac.* i. But *Judas Maccabeus*, having undertaken a War againſt the Captains of *Antiochus*, overthrown their Armies, and recovered the City; purged the Temple, threw down and burnt the Idol, and again dedicated both the Altar and Temple to the Worſhip of God, in Memory of which this Feaſt was celebrated.

He alſo ordained, that the Dedication of the Temple, which was made at the firſt in eight Days, ſhould be renewed and celebrated by Anniverſary Holy-Days, for eight Days together, with Rejoicing and Gladneſs, beginning from the twenty-fifth of *Ciſleu*, 1 *Mac.* iv. And this is the Feaſt whereof St. *John* the Evangeliſt makes mention, and whereat our Saviour *Chriſt* himſelf was preſent. *Luke* v. 1.

7. The Solemnity of the Expiation of the Tower of *Jeruſalem*, inſtituted by *Simon Aſmonæus*, Brother to *Judas Maccabeus*, on the twenty-third Day of the Month *Ijar*. For having by Famine taken the Tower of *Jeruſalem*, which a Garriſon of *Antiochus* had, until then defended, he celebrated the ſame as on this Day, by a ſolemn Rite, to the great Rejoicing of the whole City, and commanded it to be, every Year, celebrated by Poſterity, with feſtival Joy and Gladneſs. 1 *Mac.* 13.

8. And laſtly, The *Marriage Feſtivities*, obſerved by the Space of ſeven Days, *Gen.* xxix. 22, and *Judg.* xiv. 10, which are honourably mentioned by *Chriſt* in his Parables, and vouchſafed his Preſence and firſt Miracle, *John* ii. 8.

And theſe are the *Feaſts* and Solemnities celebrated by the antient *Jews*, whereof ſo frequent Mention is made in Scripture.

For the reſt, inſtituted after their Deſtruction and Repudiation, and obſerved by the modern *Jews*, in all Places whereſoever they are diſperſed; as the Feaſt of the new Year; the Feaſt of Reconciliation; the Feaſt of Gladneſs, or Joy of the Law;

Law; the Feaſt Days of the Equinoxes and Solſtices, &c. none of which are mentioned in the Old Teſtament, I ſhall forbear ſaying any thing about them; putting here a Period to the *Feſtivals* and *Faſts* of the *Jews*.

II. Of the FESTIVALS and FASTS of the CHRISTIANS.

Concerning the Solemnities of the *Chriſtians*, we find not any one certainly declared in all the New Teſtament; neither is any Man bound to the ſtrict Obſervation of thoſe which were uſed of old by the *Jews*: Yet, becauſe the Exerciſe of Godlineſs may be oft times interrupted, through the Infirmities of the Fleſh, and Cares of the World, and that nothing is more convenient, nothing more neceſſary to the Confirmation and Increaſe of Faith, and the Exerciſe of the Chriſtian Religion, than that Men ſhould have certain Days, whereon frequently to meet in the public Aſſembly, and to hear the Word of God, ſeeing that Faith cometh by hearing thereof; therefore hath the *Chriſtian* Church very worthily ſet apart certain Feſtivals, Holy Days, or Solemnities, and commanded the ſame to be religiouſly obſerved in the public Congregation, that ſo all daily Labours, and politic Affairs, being laid aſide, we might thereon entirely apply ourſelves to the public Service of God, to reading, and holy Meditation, with Joy and Gladneſs, as well of Mind as of Body.

The firſt of which is derived from the *Saxons*, commonly called *Sunday*, or the weekly Feaſt of the *Reſurrection* of *Chriſt*, and thence called the *Lord's-Day*, inſtituted by the Apoſtles of Chriſt, in the room of the rejected *Jewiſh Sabbath*: to the End

1. That *Chriſtians* might not ſeem to be tied and obliged to *Judaiſm*, and the Ceremonies of the *Jews*, but teſtify the Abrogation of the Moſaical Feaſts, and manifeſt the Liberty received by Chriſt.

2. That as the *Jewiſh Sabbath* did continually bring to Mind the former World, finiſhed by Creation, ſo the Lord's Day might keep us in perpetual Remembrance of a far better World, begun by him, who came to reſtore all things, and to make both Heaven and Earth new: for which Cauſe *they* honoured the laſt Day, *we* the firſt in every ſeven Days throughout the Year.

3. Becauſe that Chriſt on this Day roſe from the Dead; perfected the Work of Man's Redemption, and ſo entered into the Glory of the New Teſtament. 4. That

4. That (if Creatures be admitted) we can by no other Creature more congruouſly apprehend the Majeſty of the mighty and ſupereminent Chriſt, the Son of Righteouſneſs, than by the glorious Light of the Sun, the once ſuppoſed Ruler of this Day.

The other Holy-Days are divided into General, *i. e.* ſuch as are generally celebrated by all Men, and termed Solemnities; as the *Nativity* and *Circumciſion* of our Saviour, *Epiphany*, *Purification*, *Annunciation*, *Reſurrection*, *Aſcenſion*, *Pentecoſt*, *Trinity*, *&c.* And Particular, *i. e.* ſuch as are kept by ſome particular Church, or of ſome whole Country or Community, as the Faſt-Days for averting ſome public Calamity, and the Feſtivals for obtaining ſome public Deliverance; or elſe by ſome one Biſhop's See, Pariſh, or Town, called the proper Holy-Days of the Place, as the Days of ſome particular Perſons, Donors, or Benefactors: All which, whether they be general or particular, for the whole Day, or at leaſt in the Time of the Morning, are ever eſteemed holy; Divine Service being generally performed on ſuch Days.

They are again divided (in reſpect of the Days whereon they fall in the Calendar) into moveable, and fixed or immoveable.

1. Of the MOVEABLE FEASTS.

The *moveable Feaſts* are thoſe, which howſoever they are celebrated on the ſame Week-Day, have got no fixed Seat in the Calendar, but in divers Years, fall upon ſundry Days of the Month. Such are all the Lord's Days throughout the Year, and ſo indeed the interjected Days, which are fixed to certain Weeks. Whereof

1. The Lord's Day (when any happens) betwixt the Feaſt of *Circumciſion* and *Epiphany*, hath no certain Name aſſigned to it, ſave only the firſt or ſecond *Sunday* (whichſoever it is) after *Chriſtmas-Day*. But the Lord's-Days that follow after the *Epiphany*, are denominated according to the numeral Order, by which Means they ſucceed the ſame; as the firſt *Sunday* after it, is called the firſt *Sunday* after *Epiphany*; the next the ſecond, *&c.* Whereof there are in ſome Years four, in others more or fewer, according to the greater or leſſer Quantity of the *Intervallum majus*, or Diſtance of Time between the *Epiphany* and *Eaſter*; for that is what I conceive Sir *George Wharton* means by the *Intervallum majus*, that being the greater Interval compared with the leſſer one between the

Epiphany

Epiphany and *Septuageſima Sunday*. Howbeit, the *Sunday* next preceding that of *Septuageſima*, is always the laſt of the *Sundays* after the *Epiphany*; and the *Monday* next after the *Epiphany*, is called *Plough-Monday*; becauſe the poorer Sort of People draw a Plough through the Streets, in the northern Parts of *England*, in order to excite the Charity of ſuch People as are able and willing to beſtow it upon them.

The next four Lord's-Days are thus nominated, *viz. Septuageſima*, *Sexageſima*, *Quinquageſima* and *Quadrageſima*; the firſt three whereof had their Names from their Order by which they precede *Quadrageſima*, as *Quinquageſima* is ſo called, becauſe the next anteceding *Quadrageſima*, and ſo of the reſt.

For the better underſtanding the Nature of theſe three *Sundays*, viz. *Septuageſima*, *Sexageſima*, and *Quinquageſima*, I ſhall proceed in a retrograde Order, and begin with that of *Quinquageſima*.

1. Concerning *Quinquageſima*: Foraſmuch as the Church hath commanded a Faſt conſiſting of forty Days before *Eaſter*, called *Quadrageſima*, or the holy Time of *Lent*, wherein there are but thirty-ſix Days, beſides the Lord's-Days, on which ſhe faſteth not; in regard of her Joy for his Reſurrection: Therefore to ſupply this Defect, there were four Days (viz. *Aſh-Wedneſday*, and the three following Days) of the preceding Week, added to the *Quadrageſimal* Faſt. After which it was (firſt by *Teleſphorus*, Biſhop of *Rome*, and Martyr, who flouriſhed *Anno Chriſti* 141, and ſince that by *Gregory* the great) decreed, that all Prieſts ſhould begin their Faſts two Days ſooner, *viz.* the *Monday* and *Tueſday* before the four ſo added; to the End, that as they preceded the People in Dignity, ſo they might alſo precede them in Sanctity. Wherefore to the Week of *Quadrageſima* was this other added, named *Quinquageſima*. It is alſo called *Shrove-Sunday*, becauſe it is the *Sunday* immediately preceding and neareſt to *Shrove-Tueſday*.

2. Touching *Sexageſima*, it is to be obſerved, that *Melchiades*, Biſhop of *Rome*, and Martyr (who flouriſhed *Anno Chriſti* 311) inſtituted, that none ſhould faſt upon *Friday*, becauſe of the Lord's Supper and Aſcenſion, as upon that Day; ſo neither on the *Sunday*, which being the firſt Day of the Week ſolemnizeth the Reſurrection, thereby to put a Difference between the *Chriſtians* and the *Gentiles*. Therefore it pleaſed the Ancients, for Redemption of the *Fridays* in

Quinquageſima

Quinquageſima (except *Good-Friday*) to add this other Week, which they called *Sexageſima*.

Note, *Though the* Lord's Supper *was inſtituted on the* Thurſday *Night before the Crucifixion, according to the civil Day, which begins at Midnight, yet the eccleſiaſtical or ſcriptural Day, begins ſix Hours ſooner, that is, at Six o'Clock in the Evening, and holds till Six in the Evening of the enſuing Day. Hence the* Thurſday *Evening preceding, immediately,* Friday *Morning, and both making but one Day, the Inſtitution of the Lord's-Supper, is* (above) ſaid *to be* as on Friday: *And if the Aſcenſion of our Saviour was in the Afternoon, it will hold nearly good in this Reſpect alſo: but the Scriptures being ſilent in this Caſe, makes it difficult to determin the particular Time of the Day when Chriſt aſcended into Heaven.*

3. *Septuageſima* is ſaid to have been inſtituted for two Reaſons;

(1.) For ſupplying or making up that which lacketh. For in regard ſome have not only not faſted upon the *Friday* (and therefore *Sexageſima* was inſtituted, as before) but neither alſo upon *Saturday*, becauſe thereon our Saviour reſted in the Grave, in token of our future Reſt; (and indeed it is noted out of St. *Auguſtine*, that the People of *Aſia*, and ſome others, grounding their Practice on a certain Tradition of the Apoſtles, did not faſt upon the *Saturday*) to ſupply therefore the ſeven Days of *Sexageſima*, was thereunto added this Week, or Sev'n-night, called *Septuageſima*.

(2.) This Time of *Septuageſima*, denotes unto us the Exile and Afflictions of Mankind from *Adam*, to the End of the World; and therefore all Songs of Joy, were anciently intermitted by the Church, during the Time of *Septuageſima*. And as of old, during the ſeventy Years Captivity in *Babylon*, the *Iſraelites* laid aſide their Inſtruments, ſaying, *Pſalm* cxxxvii. 4. *How ſhall we ſing the Lord's Song in a ſtrange Land?* So now the Church lays aſide her Songs of Praiſe during all this Time.

Of SHROVE TUESDAY,

And of the Cuſtom of Ringing the Great Bell, in ancient Pariſh-Churches, at Ten o'Clock in the Morning.

This Day always immediately precedes *Aſh-Wedneſday*; and was, in the *Romiſh* Times, in *England*, and is now in all *Romiſh* Countries abroad, the Day of a general Confeſſion in every Pariſh. For the Word *Shrive* is an old *Saxon* Word of which *Shrove* is a Corruption) and ſignifies Confeſſion; hence *Shrove-Tueſday* ſignifies *Confeſſion-Tueſday*; on which Day all the People in every Pariſh throughout the Kingdom, were

were obliged to confeſs their Sins, one by one, to their own Pariſh-Prieſts, in their own Pariſh-Churches; and that this might be done the more regularly, the great Bell in every Pariſh was rung at Ten o'Clock in the Morning (or perhaps ſooner) that it might be heard by all, and that they might attend according to the Cuſtom then in Uſe. And as (God be praiſed) the *Romiſh Religion* has given Way to a much better, I mean the *Proteſtant Religion*, yet the Cuſtom of ringing the great Bell in our ancient Pariſh Churches, at leaſt in ſome of them, yet remains, and obtains, in and about *London*, the Name of *Pancake-Bell*; perhaps becauſe, after the Confeſſion, it was cuſtomary for the ſeveral Perſons to dine on *Pancakes* or *Fritters*. Later Churches indeed, have rejected that Cuſtom of ringing the Bell on *Shrove-Tueſday*, but the Uſage of Dining on *Pancakes*, *Fritters*, and ſuch like Proviſion ſtill continues.

Of the FAST of LENT.

LENT, in the old *Saxon* Language ſignifies the *Spring*: And as the Time, or Forty Days of Faſting and Humiliation, generally obſerved by *Chriſtians* before *Eaſter*, happens in or near the Spring, therefore that Time of Faſting is commonly called *Lent*.

Why this Faſt ſhould be confined to forty Days, neither more nor leſs, may be judged to ariſe from a Sanction given to that Number, for the following Reaſons, *viz.*

Forty Days and *forty* Nights it continued raining, when the old World was drowned. *Gen.* vii. 4, 12.

Forty Years the Children of *Iſrael* did Penance in the Wilderneſs. *Numb.* xiv. 34.

Ten times *Forty*, or four hundred Years, the Children of *Iſrael* were afflicted, before they obtained their Deliverance by *Moſes*. *Gen.* xv. *Acts* vii. 6.

Forty Stripes were given to Malefactors, when they were corrected. *Deut.* xxv. 4.

Forty Days and *forty* Nights *Moſes* faſted twice, at his receiving the Law, and once more at his deprecating God's Anger againſt the *Iſraelites*. *Deut.* ix. 9, 18, 25.

Forty Days *Elias* faſted in the Wilderneſs. 1 *Kings* xix. 8.

Forty Days the *Niniv-ites* were allowed to repent in. *Jonah* iii. 4.

Forty Days our bleſſed Saviour faſted in the Wilderneſs. *Matt.* iv. 2. And

Forty

Forty Days he converſed with his Apoſtles after his Reſurrection. *Acts* i. 3.

So that whoever conſiders theſe Facts, cannot but think that this Number of Days was appointed by the Church, to be uſed by all as the common ſolemn Number belonging to extraordinary Humiliation. *Vid. Nelſon's Feſtivals and Faſts.*

Sir *Richard Baker* ſaith, that this Faſt of *Lent* was firſt commanded to be obſerved in *England*, by *Ercombert*, the 7th King of *Kent*, before the Year of Chriſt 800.

Of ASHWEDNESDAY.

This is the Head, or Beginning of the *Quadrageſimal* Faſt, or holy Time of *Lent*, dedicated by *Gregory* the Great, to the Conſecration of and Sprinkling with Aſhes, being therefore called *Dies Cinerum*, or *Aſhwedneſday*. And *Hoſpinian* confeſſeth, there was extant an Homily of *Maximus*, Biſhop of *Tours* in *France*, with this Inſcription, IN DIE CINERUM, which ſhews the Inſtitution thereof before his Time: For that *Maximus Taurinenſis* lived 170 Years before *Hoſpinian viz. Anno Chriſti* 440.

Quadrageſima is ſo called, becauſe (as before has been obſerved) it is forty Days diſtant from *Eaſter*, comprehending the Faſt of *Lent*, as kept by the primitive Chriſtians, in Imitation of our Saviour's Faſt of forty Days and forty Nights in the Deſert. In the Latin Church, the ſeveral *Sundays* in *Lent* obtain'd different Names from the firſt Words of ſuch *Antiphons* as were ſung on thoſe Days, *viz. Invocavit*; *Reminiſcere*, *&c.* but in *England*, thoſe *Sundays* now go by the Names, firſt, ſecond, third, *&c. Sunday* in *Lent*.

The fourth *Sunday* was called *Dominica de Roſa*, or *Roſe-Sunday*, from the golden Roſe, which the Biſhop carried in his Hand before the People in the Temple: Likewiſe *Dominica de Panibus*, or *Loaf-Sunday*, becauſe thereon the Miracle of the five Loaves in the Goſpel uſed to be explained: In *England* we call it *Mid-lent Sunday*.

The ſixth was called *Dominica Magna*, or great Lord's Day, becauſe of the great and ineffable good Things which befel the Faithful in the following Week, *viz.* Sin cancelled; Death aboliſhed; Heaven opened; Scripture verified; Man redeemed; and the Tyranny of the Devil ſpoiled by the Death of Chriſt. It is alſo called *Dominica Palmarum*, or *Palm-Sunday*, from the Branches of Palms, which the *Jewiſh* People ſtrewed

on

on the Ground, when our Saviour (as on this Day) entered *Jeruſalem*. Likewiſe *Dominica Paſſionis*, or *Paſſion-Sunday*, becauſe it was the *Sunday* next before his Paſſion.

The *Wedneſday*, next after this, is the Council-Day of the Scribes and Phariſees: The *Thurſday* following, the Paraſceve, or Preparation of the legal Paſſover; and the Night thereof, the Inſtitution of the Supper; this is otherwiſe called *Maundy Thurſday*, from a Ceremony anciently uſed by the Biſhops and Prelates in Cathedral Churches, and Religious Houſes, of waſhing the Feet of thoſe who were ſubject to them. Which Ceremony is terminated the Fulfilling the Mandate, and is in Imitation of our Saviour Chriſt, who on this Day at Night, after his laſt Supper, and before his Inſtitution of the bleſſed Sacrament, waſhed his Diſciples Feet, telling them afterwards, that they muſt do the like to one another, which is the Mandate whence the Day is denominated. At the Beginning of the aforeſaid Ceremony, theſe Words of Chriſt, uttered by him after his waſhing their Feet, *John* xiii. 34. were ſung for an Antephon, *viz. Mandatum novum do vobis, ut diligatis invicem, ſicut dilexi vos. A new Commandment I give unto you, that ye ſhould love one another, as I have loved you.* And laſtly, *Good-Friday*, being the Day of the Paſſion and Croſs of Chriſt, whereon he ſuffered, and ſatisfied for the Sins of the whole World.

Next to the great Week, ſucceeds the *Paſſover*, or Feaſt of *Eaſter*, celebrated in Memory (not of the Angel's Tranſit in *Egypt*, according to the *Jewiſh* Cuſtom) but of the Reſurrection of our Saviour. And yet we ſtill retain the Name of *Paſſover*, not only becauſe the Lamb, which of old was killed by the *Jews* in the *Paſſover*, was a Type of the Lamb of God, *Chriſt Jeſus*, which was ſlain and ſacrificed for the Salvation of the World; but becauſe at that very time he paſſed from this World to his Father; or becauſe that then a Paſſage was made from an old to a new Life.

It is called *Eaſter* from a Compellation or Name, made up of a *German* Term, firſt brought in among us by the *Saxons*, which is *Oeſt*, ſignifying *ariſing*, or the *Eaſt*; and an *Engliſh* Term *Star*, which imports a Luminary of Heaven; and both therefore now moſt emphatically ſuited unto Chriſt and his Ariſe, whoſe *Name is the Eaſt*, Zech. ix. 12, and whoſe Nature *is the bright and Morning Star. Rev.* ii. 8. And this is the Foundation and Baſis of all the Lord's Days in the Year. And to the End, that we might have Leiſure to confirm our Faith in the grand Article of our Reſurrection, and to exert

our

our devout Affections in all thoſe happy Conſequences that are deducible from it; the Church has taken particular Care to ſet apart the two following Days, *viz.* *Monday* and *Tueſday*, for the Exerciſe of Religious Duties.

After this, immediately follows the *Quinquageſimal* Interval of fifty Days, between *Eaſter* and *Pentecoſt*, which was kept by the Primitive Chriſtians, as a whole Feſtival, in Honour of the Reſurrection and Aſcenſion of *Chriſt*, and the glorious Miſſion of the Holy Ghoſt,-with exceeding great Rejoicing and Gladneſs. It containeth ſix Lord's Days, or *Sundays*, which are all numbered according to their Diſtance from *Eaſter-Day*, as the firſt, ſecond, third, fourth, fifth and ſixth *Sundays* after *Eaſter*, whereof the firſt was anciently called *Dominica in Albis*, or *White Sunday*, becauſe all the Catechumens, or Perſons inſtructed in the Chriſtian Religion, who had been baptized in the preceding *Eaſter-Day*, appeared in white Garments; and the fifth is ſtill called *Rogation-Sunday*, and the Week following Rogation Week, invented, or as ſome think, reſtored by *Mamercus*, Biſhop of *Vienna*, a City of *Auſtria* in *Germany*, *Anno Chriſti* 452, and ſo called *à rogando Deum*, from ſupplicating God, on the Account of ſuch Earthquakes and Terrors which befel that City about that Time, as amazed the Hearts of all Men, who then began to forſake it, as a Place which Heaven ſeemed to have deſtined to Ruin. For then it was that the juſt mentioned Biſhop earneſtly exhorted the Remainder of the People, to prevent portended Calamities, by thoſe holy and virtuous Means, whereby others have prevailed with God. It afterwards became general in the Chriſtian Church; and the *Rogation Sunday*, and three following Days, *viz.* *Monday*, *Tueſday* and *Wedneſday*, were (and great Pity we cannot ſay now) extraordinarily conſecrated above all other Weeks in the Year unto Prayer and Supplication, for the following Reaſons, *viz.*

1. Becauſe Princes about this Time undertake their Wars.

2. Becauſe the Fruits of the Earth (being ſome in the Herb and ſome in their Bloſſom) are in great Hazard: In both which Reſpects all Chriſtians have good Occaſion, at this Time eſpecially, to pray.

In this Week alſo, uſually on *Aſcenſion-Day*, it hath been an ancient and good Cuſtom, yearly (till of late Days) to make Perambulations and Proceſſions in every Pariſh and Townſhip, for viewing and conſidering the ancient Bounds and Limits, to prevent Incroachments and Contentions.

On

On the ſame *Aſcenſion-Day* alſo of this Week (which is the fortieth Day from *Eaſter* incluſive, was wont to be, and is ſtill celebrated the Feaſt of Chriſt's Aſcenſion) thence called *Aſcenſion-Day*, which is the Conſummation of all he did and taught whilſt on Earth, and therefore termed *Fælix clauſula totius Intinerarij filij Dei, The happy Period of the whole Journal of the Son of God*; the very Sabbath of all his Labour in the Work of our Redemption.

After the ſixth *Sunday*, doth ſucceed the Solemnity of *Pentecoſt*, ſo called, becauſe the fiftieth Day incluſive from the Reſurrection of Chriſt. It was anciently called *Dominica in Albis*, like the firſt *Sunday* after *Eaſter*, or *White Sunday* (now corruptly *Whitſunday*) partly from the new baptized Chriſtians then appearing in white Garments, in Token of the Joy and Solemnity thereof, which they were obliged to preſerve in the future Courſe of their Lives; and partly from the Miſſion of the Holy Ghoſt, or glorious Light of Heaven, which was this Day ſent down upon the Earth from the Father of Lights, and ſat upon each of the Apoſtles in the viſible Appearance of *fiery cloven Tongues*. And to the End that we might have Leiſure to offer up our Praiſes and Thankſgivings to God, for that perfect Diſcovery he hath made of his Will to Mankind, in the Chriſtian Revelation, which contains the beſt and ſureſt Means of ſerving him, and of performing thoſe Obligations we lie under to the divine Majeſty, and which hath been confirmed by the Deſcent of the Holy Ghoſt; ſo the Church hath taken particular Care to ſet apart the two following Days, *viz. Monday* and *Tueſday*, for the Exerciſe of religious Duties.

The next is the Feaſt of the holy *Trinity* (being the Lord's Day next following) which was inſtituted *Anno Chriſti* 827, in Honour of the holy *Trinity*, by *Gregory* the Fourth, who then held the *Epiſcopal* Chair.

The *Thurſday* next after is the Feſtival of the *Body of Chriſt*, commonly called *Corpus Chriſti* Day, which *Urban* the fourth, Biſhop of *Rome*, inſtituted about the Year of Chriſt 1264.

The *Sundays* following this of the holy *Trinity*, are all of them called according to their numeral Order, whereby they ſucceed *Trinity Sunday*, until the firſt *Sunday* in *Advent*; they continually looking backwards towards the Myſtery of the *Trinity*, till about the Mid-way, and then looking forward towards the *Advent* or coming of *Chriſt*.

Laſtly, The four Lord's Days immediately preceding the Nativity of Chriſt, are called the *Sundays* in *Advent, ab adventu*

Domini in Carnam, i. e. *from the coming of Chriſt in the Fleſh*; and were inſtituted by the Church, to the End, that from the firſt of them, until the *Nativity* of our Saviour, our Minds might be prepared to a ſober Life, and a pious Meditation of his Birth, then approaching; alluding to that Paſſage in *Iſaiah* xl. 3. *Prepare ye the Way of the Lord, make ſtraight in the Deſert a Highway for our God.*

Of the Fixed or Immoveable FEASTS.

THE fixed, ſtative, or immoveable Feaſts, are they, which notwithſtanding they fall upon divers Days of the Week, yet they do not change, but always fall upon one and the ſame Day of the Month, and ſo have a fixed and certain Seat in the Calendar.

Of this Sort are,

1. St. *Andrew*, commemorated *November* 30. He was the Brother of *Simon-Peter*, and by Profeſſion a *Fiſherman*, yet an Apoſtle and Martyr; and as he firſt came to Chriſt, and followed him before any of the other Apoſtles; ſo he firſt appears among the Church Solemnities: His Day beginning the Order of the Service for all the other Saints Days in the Year; becauſe his Feaſt ever falls out to be either next before, or next after *Advent Sunday*, as bringing the firſt News of the coming of Chriſt. He preached in *Scythia*, and in the neighbouring Countries; after that in *Cappadocia*, *Galatia*, *Bithynia*, and along the *Euxine* Sea: Laſtly in *Thrace*, *Macedonia*, *Theſſaly* and *Achaia*, where (in the Time of *Veſpaſian*) he was crucified by the Command of *Ægeus*, Proconſul of *Achaia*, and buried at *Patris*, a City of *Achaia*, about the 80th Year of Chriſt.

2. St. *Thomas Didymus*, commemorated *December* 21, Chriſt's Apoſtle and Martyr. He preached to the *Parthians*, *Medes* and *Perſians*; alſo to the *Caramans*, *Hircans*, *Bactrians*, *Medes* and *Magicians*: And was ſlain by a Lance at *Calamina*, ſome ſay *Malapour*, a City of *India*, where he was honourably buried, *Anno Chriſti* 35, ſome ſay 25.

3. The Feaſt of Chriſt's Nativity, ordinarily called *Chriſtmas-Day*, which, without all Doubt, was on the 25th Day of *December*, as has been, long ſince, fully proved by *Edward Fiſher*, Eſq; in his Vindication of our Goſpel Feſtivals.

It was commonly called by the antient *Saxons* Mæꝑꝑan, [*Mærran*] ſays Sir *George Wharton*; but with more Propriety Mæꝛꝛe [*Mæſſe*] as Mr. *Bailey* obſerves, ſignifying Maſs; and accordingly, with them, an holy Feſtival Day was called Mæꝑꝑan dæg, or Mæꝛꝛe dæg, *i. e.* Maſs-Day. In

In the Northern Parts of this Nation it is called *Yule*, which ſignifies a Time of Rejoicing and Feſtivity. By the Weſtern or Latin Church, *Luminaria*, or the Feaſt of Lights, becauſe they uſed many Lights and Candles at this Feaſt; or rather becauſe Chriſt, the true Light, then came into the World. And this is the Body and Foundation of all other Chriſtian Feſtivals, and ought to be celebrated accordingly.

4. St. *Stephen* (obſerved *December* 26) was the firſt Martyr, and was ordained one of the ſeven Proto-deacons, who were to take Care of the Treaſure of the Church, and diſtribute it rightly to the Widows and the Poor. It was this St. *Stephen* who zealouſly refuted the erroneous Opinions of the *Jews*, concerning the Meſſiah, affirming *Jeſus Chriſt* of *Nazareth*, to be the true one foretold by the Prophets; and being therefore accuſed of Blaſphemy, was condemned and ſtoned to Death, by the *Jews*, at *Jeruſalem*, *Anno Chriſti* 35.

5. St. *John* (obſerved *December* 27) the Brother of St. *James*, who was alſo an Evangeliſt, and the beſt beloved Apoſtle. He preached the Goſpel in *Aſia*, and founded the Churches of *Smyrna*, *Pergamos*, *Sardis*, *Philadelphia*, and *Laodicea*; but his chief Place of Reſidence was at *Epheſus*, where he wrote his Goſpel. The Emperor *Domitian* ordered him to be put into a Caldron of boiling Oil, that he might be ſcalded to Death, but being miraculouſly preſerved, he came out more lively and vigorous than when he was put in. The Emperor being diſappointed thereat, was regardleſs of the Miracle, and exiled him into *Patmos*, an Iſland in the *Egæan* Sea, where he wrote his Revelation, which was afterwards publiſhed at *Epheſus*, by *Gaius*, his Hoſt and Deacon. After the Death of *Trajan*, he returned from *Patmos*, and remained at *Epheſus*, until he had lived 100 Years or upwards, where he died (as ſome ſay) of an Apoplexy, *Anno Chriſti* 104.

6. The holy Innocents of *Bethlehem*, celebrated *December* 28. Theſe were ſlain by *Herodes Aſcalonita*, otherwiſe called *Herod* the Great, in our Saviour's ſtead, though not for his Sake, to the Number of 14000, amongſt whom, his own Son (as ſome Hiſtorians affirm) eſcaped not his (till then) unheard of Cruelty; which gave *Auguſtus Cæſar* occaſion to ſay, *Melius eſt eſſe Herodis Porcum quam Puerum: It is better to be Herod's Hog than his Son.*

7. The *Circumciſion* of Chriſt, obſerved *January* 1, in Commemoration of the Myſtery of his legal *Circumciſion*, when he, who was the Truth and Subſtance, did at once fulfil and take away the *Type* thereof.

8. The *Epiphany*, or *Apparition*; or the Feaſt of *Twelfth-Day* after *Chriſtmas*, obſerved *January* 6th; ſo called and celebrated in Memory and Honour of Chriſt's Manifeſtation, or Apparition made to the *Gentiles*, by a miraculous *Comet*, or Blazing Star, by virtue whereof he drew and conducted the three *Magi* or *Sages* (commonly called the three Kings) who, upon Sight of that Star, came out of the *Eaſt*, into the Country of *Paleſtine*, or *Jewry*, to adore him in the Manger, where (twelve Days after Chriſt's Birth) they preſented him with *Gold*, in Teſtimony of his Regality; *Frankincenſe*, in Teſtimony of his Divinity; and *Myrrhe*, in Teſtimony of his Humanity.

Or, from the Holy Ghoſt's appearing in the Shape of a Dove, at Chriſt's Baptiſm, thirty Years after (for this 6th Day of *January* was the Day of his Baptiſm) and therefore it is alſo called by *Alcas Cyriacus*, in an *Arabic* Manuſcript of Aſtronomical Tables, in the Archbiſhop's Archives in the *Oxford* Library (as the learned Dr. *Hammond* informed Sir *George Wharton*) The Feaſt of *Epiphany*, or Benediction of Waters; the Vigil whereof was of old called *Vigilia Luminum*, or the Eve of Lights, becauſe the Ancients were then wont to ſend Lights one to another; or, which is more probable, becauſe they illuminated their Houſes.

This Day was alſo celebrated by the Romans in Honour of *Auguſtus Cæſar*, for the Conqueſt of *Parthia*, *Egypt* and *Media*, which were thereupon added to the Roman Empire; wherefore the Church, willing to change that Solemnity for a better, inſtituted this of the *Epiphany*, in the room of it.

9. The *Converſion* of St. *Paul*, obſerved *January* 26, who in an extraordinary Manner (that is by a Light from Heaven, greater than the Brightneſs of the Sun) was converted to the Chriſtian Faith, and made an Apoſtle of Chriſt, whom before that Time he had perſecuted; as appears at large in the ninth Chapter of the Acts of the Apoſtles: He is commemorated on this Account, becauſe it was, not only wonderful in itſelf, but a miraculous Effect of the powerful Grace of God, and therefore highly beneficial to the Church of *Chriſt*.

10. The Teſtification of Chriſt's true *Incarnation*, was by the Feaſt of the *Purification* of the bleſſed Virgin, obſerved *February* 2, when *Jeſus* was preſented in the Temple, and proclaimed by *Simeon* and *Anna* to be the *Meſſiah*. This Feaſt was inſtituted by *Juſtinian* the Emperor, *Anno Chriſti* 542.

11. St. *Matthias*, obſerved *February* 24, who being one of the ſeventy Diſciples, was (after the Aſcenſion) choſen an Apoſtle

Apoſtle by Lot, in the room of *Judas* the Traitor: He preached the Goſpel in *Judea*, and afterwards, as ſome think, he travelled Eaſtward, where he was firſt ſtoned by the *Jews*, for Blaſphemy, and then beheaded after the Roman manner. *Anno Chriſti* 51.

12. The Feaſt of the *Annunciation* of the bleſſed Virgin, obſerved *March* 25, is kept in Remembrance of the Time when the *Angel Gabriel* declared our Saviour's Conception, or Incarnation by the Holy Ghoſt.

13. St. *Mark* the Evangeliſt, who penned the Life, Acts, Miracles, Death and Reſurrection of our Saviour, and is commemorated on the 25th Day of *April*. He was the firſt Biſhop of *Alexandria*, where he preached the Goſpel, and alſo over all the bordering Regions, from *Egypt* to *Pentapolis*. At the ſame *Alexandria*, in the Time of *Trajan*, one of the Roman Emperors, he had a Rope tied about his Neck (ſome ſay Feet) by which he was drawn from the Place called *Bucolis*, unto another called *Augets*, where he was burnt to Aſhes by the furious Idolaters (againſt whom he preached) *Anno Chriſti* 63, and buried at *Bucolis*.

14. St. *Philip* and St. *James*, who are commemorated on the 1ſt Day of *May*, were both Apoſtles and Martyrs. There were two *Philips*, the one an Apoſtle choſen by Chriſt, the other a Deacon, he being one of the ſeven choſen by the Apoſtles. The firſt, *viz.* the Apoſtle, was of the City of *Bethſaida*, and probably a Fiſherman, who preached the Goſpel at *Phrygia*. The other, *viz.* the Deacon, was he, who converted the Eunuch *Candaules*, belonging to *Candace*, Queen of *Ethiopa*. He is by ſome ſaid to have ſent twelve Diſciples into *Britain*, for Converſion thereof. But though this Day commemorates St. *Philip* the Apoſtle, in the Goſpel, and St. *Philip* the Deacon in the Leſſon, yet it was the Apoſtle whom the *Painims* laid hold on and crucified, under the Emperor *Claudius*, at *Hierapolis*, about the Year of Chriſt 53. No Account being tranſmitted about *Philip* the Deacon.

The latter, *viz.* St. *James* the Leſs, Son of *Alpheus*, was the Author of that excellent Epiſtle bearing his Name, and was for his Wiſdom and Piety, ſurnamed the Juſt. After the Aſcenſion of Chriſt he was created Biſhop of *Jeruſalem*, where (when he had governed that Church for the Space of thirty Years) he was firſt ſtoned, and afterwards ſet on a Pinnacle of the Temple, from whence he was precipitated or thrown down, and then (lying with his Thighs broken, and half dead, lifting up his Hands to Heaven, and praying for his

Murderers) knocked on the Head with a Fuller's Club, in the ſeventh Year of *Nero* the Roman Emperor, and in the ninety-ſixth Year of his Age, about thirty-four Years after Chriſt's Aſcenſion.

15. The Feaſt of St. *Barnabas*, obſerved on the 11th Day of *June*. He was by the Antients generally eſteemed one of the ſeventy Diſciples of our Saviour. It is thought he ſuffered *Martyrdom* at *Salamis*, a City in the Iſland of *Cyprus*, where the *Jews* being come from *Syria*, ſet upon him as he was diſputing in the Synagogue; in a Corner of which they ſhut him up till Night, and then brought him forth; and after they had put him to exquiſite Tortures, ſtoned him to Death, *Anno Chriſti* 49 or 50. He was afterwards buried by his Kinſman *Mark*, in a Cave not far diſtant from the City. The Remains of his Body are ſaid to have been diſcovered in the Reign of *Zeno* the Emperor, *Anno Chriſti* 485, and St. *Matthew's* Goſpel, written in *Hebrew* by St. *Barnabas's* own Hand, lying upon his Breaſt.

16. The Feaſt of the *Nativity* of St. *John the Baptiſt*, obſerved the 24th Day of *June* (Son of *Zachariah* and *Elizabeth*) who was of the Tribe of *Levi*. It was him that ſhewed to his Diſciples *the Lamb of God*, the Son of the Father, *that taketh away the Sins of the World*. He was beheaded by *Herodes Antipas*, otherwiſe called *Herod* the *Tetrarch*, at the Requeſt of *Herodias*, the Wife of his Brother *Philip*, *Anno Chriſti* 30, but it is his Nativity only which the Church celebrates.

17. St. *Peter* and St. *Paul*, obſerved the 29th Day of *June*. The firſt whereof was Chief of the Apoſtles, and preached the Goſpel in *Pontus*, *Galatia*, *Cappadocia*, *Bithynia*, and at *Rome*; where he was afterwards crucified under *Nero*, with his Head downward (at his own Deſire) becauſe he ſaid he was not worthy to be crucified in the ſame manner with his Lord and Maſter, *i. e.* with his Head upward, and there alſo buried.

The latter, *viz.* St. *Paul* (who being called of Chriſt himſelf, after his Aſcenſion, and numbered in the Catalogue of the Apoſtles) preached the Goſpel from *Jeruſalem* to *Illyricum*, and many other Cities in *Greece* and *Aſia*; from thence to *Italy* and *Spain*; and laſtly at *Rome*, where he was beheaded under *Nero*, *Anno Chriſti* 68, on the ſame Day that St. *Peter* was crucified, with whom he there lieth buried.

18. St. *James* the Greater, Brother to St. *John*, Son of *Zebedee*, an Apoſtle and Martyr, commemorated the 25th Day

Day of *July*. He preached the Goſpel to the twelve diſperſed Tribes; and alſo in *Spain*, where he is owned as their Tutelar Saint; and laſtly, was ſlain by the Sword, or beheaded, by *Herod Agrippa*, Grandſon of *Herod* the Great, in *Judæa*, *Anno Chriſti* 45, where alſo he was buried, and ſo conſequently was the firſt of all the twelve Apoſtles in Chriſt's Kingdom.

A very remarkable Circumſtance happened as this Apoſtle was led to the Place of his Martyrdom, which was this; his Accuſer being enlightened by the Courage and Conſtancy St. *James* ſhewed at his Trial, repented of what he had done, and falling at the Apoſtle's Feet, heartily begged his Pardon for what he had teſtified againſt him: The holy Man, after a little Surpriſe, raiſed him up, and embracing him, ſaid, *Peace be to thee:* Whereupon he publickly profeſſed himſelf a Chriſtian, and was beheaded at the ſame Time.

19. St. *Bartholomew* (commemorated *Auguſt* 24) who was Nephew (ſome ſay) and Heir to a King of *Syria*, yet both an Apoſtle and Martyr. He preached the Goſpel to the *Indians*; afterwards, he preached in *Hierapolis* and *Lycaonia*: and laſtly at *Albenople* in *Armenia the Great*, where by the Command of the Governor of that Place, he was the firſt Day beaten with Cudgels, and ſtoned; the next, crucified and excoriated, or flea'd alive, as he was faſtened to the Croſs. And, laſt of all (whilſt Breath remained) beheaded, *Anno Chriſti* 51. Wherefore it is called *Duplex Feſtum*, or double Feſtival, ſome keeping it the 25th, as we the 24th of *Auguſt*, he ſuffering two Days together.

20. St. *Matthew* (obſerved *September* 21) who being a *Jew* by Birth, and a Publican or Toll-Gatherer by Profeſſion, became a *Diſciple*, an *Apoſtle*, an *Evangeliſt* and *Martyr*. He wrote the Goſpel of Chriſt in the *Hebrew* Tongue, and delivered it to *James* the Brother of our Lord, then Biſhop of *Jeruſalem*. The ſame he preached in *Æthiopia*, where he was entertained by the Eunuch, Chamberlain to Queen *Candace*, whereof mention is made in the Acts of the Apoſtles, and prevailed ſo far, that *Æglippus* the King, and his People came to Baptiſm; but there reigning after him one *Hyrtacus*, who hated the Apoſtle, by his Command, he was run through with a Sword, or beheaded, in the Year of Chriſt 71.

21. St. *Michael* the Archangel, is he, who figured Chriſt, and with a Hoſt of Angels fought for his Church, againſt the red Dragon, or the Devil, and his Angels; and is commemorated on the 29th Day of *September*.

22. St. *Luke* (obſerved *October* 18) born in *Syria*, by Profeſſion a *Phyſician* of *Antioch*, an Evangeliſt, and the Penman of the Apoſtles Acts: He accompanied the Apoſtles in their Peregrination, but eſpecially St. *Paul*, and died at *Epheſus* (ſome ſay by being hanged upon an Olive Tree) in the 84th Year of his Age, where alſo he was buried, *Anno Chriſti* 74; but many Years after tranſlated, together with *Andrew* and *Timothy*, to *Conſtantinople*, in the Time of *Conſtantine*, Son of *Conſtantine* the Great.

23. St. *Simon Zelotes*, and St. *Jude*, the Brother of *James*, were both Apoſtles of Chriſt. They are commemorated on the 28th Day of *October*: The firſt of which was born in *Cana*, a Town in *Galilee* (being the Son of *Cleophas* and *Mary*, according to *Euſebius*, lib. 3, cap. 11) and preached the Goſpel in *Egypt*, and *Perſia*; whence he returned and ſucceeded St. *James* in the Biſhoprick of *Jeruſalem*, where he was crucified under *Trajan*, in the 120th Year of his Age; and ſo the laſt Martyr of all the Apoſtles.

The latter, *viz.* St. *Jude* (likewiſe called *Thaddæus* and *Lebbæus*) he preached the Goſpel to the *Edeſſæans*, and throughout all *Meſopotamia*: And was ſlain at *Berytus*, by the heatheniſh Prieſts of that Place, in the Time of *Agbarus*, King of *Edeſſa*, where alſo he was honourably buried, *Anno Chriſti* 51.

24. Laſtly, The Feaſt of *All Saints* (obſerved *November* 1) is dedicated to all Chriſt's Apoſtles, Martyrs, and holy Confeſſors in general.

Of the EMBER WEEKS.

THE Ember Weeks are four in every Year, as may be ſeen in the Calendar; and anciently *Wedneſday*, *Friday*, and *Saturday* in each, were faſting Days.

They are of great Antiquity in the Church, and called by the Latin Fathers *Quatuor Anni tempora*, the four times or Seaſons of the Year. For (beſides the firſt Inſtitution of them, for quarterly Seaſons of Devotion, proportioned to each Part of the Year, as the firſt Fruits of every Seaſon, that the Whole, and each Diviſion of it, might be thereby bleſt; and again, beſides their Anſwerableneſs to the *Jejunia quatuor*, or ſolemn Days of Faſting among the *Jews*, beforementioned, that we *Chriſtians* may not be inferior to them in that Duty) an admirable Uſe is aſſigned to them in the Church, in Imitation of the Apoſtles, *Acts* xiii. 3, *Who, when they*

they had faſted and prayed, laid their Hands on Barnabas *and* Saul, *and ſent them away* to preach the Goſpel. Others think they are called *Ember Days*, or Days of Aſhes, from the no leſs ancient than religious Cuſtom of uſing Hair-Cloth and Aſhes in Time of public Piety and Penance: Or from the old Cuſtom of eating nothing on thoſe Days till Night, and then only a Cake baked under the *Embers*, or Aſhes, which was called *Panis ſubcinericius*, or *Ember-bread*.

Of the VIGILS, or FASTING EVES of FESTIVALS.

VIGIL, or *Eve*, in Church Chronology, is the Day before any Feaſt.

Though the civil Day begins at Midnight, yet the eccleſiaſtical or Scripture Day, begins at Six o'Clock in the Evening next preceding, and holds till Six o'Clock in the Evening the enſuing Day. Hence the Collect for every *Sunday* and Holy Day, by order of the Church, is to be read at the preceding Evening-Service; that is at Six o'Clock in the Evening next before, from which Time the religious Day was ſuppoſed to begin. And this firſt Part of the Holy Day, from Six o'Clock the Day before, was by the primitive Chriſtians, ſpent in Hymns, and other Devotions, in their Churches; and being often continued till late at Night, was called *Vigil*, from *Vigilo*, I watch, or keep awake; or from *Vigilia*, a watching or keeping awake in the Night.

In the Apoſtles Days, and ſome Time after, when the poor Chriſtians durſt not appear in Public, becauſe of the continual Snares, Treacheries and Perſecutions of Tyrants, and the Enemies of their Religion, they were forced to meet in the Night Time for the Exerciſe of their Devotion. And in the firſt Church after the Times of the Apoſtles, when they ſtood not in fear of any Perſecution, they publickly watched and faſted in their Churches, before great Feſtivals, but eſpecially on the Eve of the Reſurrection. Whence grew the Cuſtom, both for Chriſtian Men and Women, to watch and faſt on the Eves of great Solemnities, in their Churches.

But foraſmuch, as in Proceſs of Time, theſe nocturnal and promiſcuous Watchings, or Night Meetings, came to be ſo abuſed, that no Care could prevent the ſeveral Diſorders and Irregularities which crept in among them, the *Vigils*, or Night Watches were prohibited; and the Faſts (which are now retained and kept on the Days preceding the greateſt Feſtivals,

and obſerved as well as the holy Faſt of *Lent)* inſtituted in their ſtead; howbeit, they are ſtill called *Vigils*, as being the Name of a Duty therein. And this (as ſome ſay) was confirmed by *Innocent* the Third, about the Year of *Chriſt* 1210.

For the very Purpoſe of the Church of God (ſaith judicious *Hooker*) both in the Number, and in the Order of the Feaſts, hath been, not only to preſerve thereby, throughout all Ages, the Remembrance of Miſeries heretofore ſuſtained, and of the Cauſes in ourſelves, out of which they have riſen, that Men conſidering the firſt, might fear the other the more; but further alſo to temper the Mind, leſt contrary Affections coming in place, ſhould make it too profuſe and diſſolute; in which Reſpect it ſeemeth, that Faſts have been ſet as Uſhers of Feſtival Days, for Prevention of thoſe Diſorders, as much as might be, wherein, notwithſtanding the World always will deſerve (as it hath done) Blame, becauſe ſuch Evil being not poſſible to be rooted out, the moſt we can do, is in keeping them low, and (which is chiefly the Fruit we look for) to create in the Minds of Men, a Love towards frugal and ſevere Life; to undermine the Palace of Wantonneſs; to plant Parſimony as Nature, where Riotouſneſs hath been ſtudied; to harden them whom Pleaſure would melt; and to keep the Tumours under, which always Fulneſs breedeth, that Children, as it were, in the Wool of their Infancy, dyed with Hardneſs, may never afterwards change Colour. That the Poor, whoſe perpetual Faſts are neceſſity, may with better Contentment endure the Hunger which Virtue cauſeth others ſo often to chuſe; and by the Advice of Religion itſelf, ſo far to eſteem the above contrary, that they, which for the moſt Part do lead ſenſual and eaſy Lives; they which are not plagued like other Men, may, by a public Spectacle of all, be ſtill put in Mind what themſelves are. Finally, that every Man may be every Man's daily Guide and Example, as well by Faſting to declare Humility, as by Praiſe to expreſs Joy in the Sight of God, although it hath herein befallen the Church, as it ſometimes did *David*, ſo that the Speech of one may be truly the Voice of the other. *I wept and chaſtened myſelf with* faſting, *and that was turned to my Reproof.* *Pſalm* lxix. 10.

OBSER-

OBSERVATIONS on ſuch other HOLIDAYS as are mentioned in the NEW CALENDAR, but not regarded by the Church of ENGLAND.

1. *LUCIAN*, a Prieſt and Martyr, celebrated by the Roman Catholics *January* the 8th.

It is affirmed by ſome, that he was one of St. *Peter*'s Diſciples, and by him was ſent into *France*, to preach the Goſpel, where he ſuffered Martyrdom: By others, that he was a Preſbyter of *Antioch*, and underſtood the *Hebrew* Tongue extreamly well; by which Means he was enabled to compare and amend the ſeveral Copies of the Bible. However that be, we find that after long and ſevere Exerciſe in the Church, he was brought before *Galerius Maximianus* the Emperor, who was then at *Nicomedia*; and having made an Apology for the Chriſtians, he was caſt into Priſon, where he was put to great Torture, and afterwards to Death.

2. *Hilary*, Biſhop and Confeſſor, commemorated the 13th Day of *January*, by the Church of *Rome*.

He was Biſhop of *Poictiers* in *France*, and a great Defender of the Catholic Doctrin againſt the *Arians*, for which being perſecuted by their Party, he was baniſhed into *Phyrgia*, where it is ſaid he died ſoon after.

3. *Priſca*, a Roman Virgin and Martyr, commemorated the 18th Day of *January*, by the Church of *Rome*.

She was a Lady who embraced the Chriſtian Religion, and upon her Refuſal to abjure it, and to offer Sacrifice to Idols, was extreamly much tortured, and after having endured the ſame with a great deal of Patience, was beheaded in the Year of our Lord 47, under the Emperor *Claudius*.

4. *Fabian*, Biſhop of *Rome*, and Martyr, commemorated by the Church of *Rome* the 20th Day of *January*.

He is ſaid to have been a married Man, and was afterwards made Biſhop of *Rome*, on the following Occaſion, *viz.* At a Meeting of the Clergy for the Election of a Biſhop of that See, it was agreed upon by them, to nominate ſome noble and worthy Perſonage of that City for that Purpoſe: *Fabian* (who was lately come out of the Country to reſide in *Rome*) being preſent, a Dove flying from above, ſuddenly ſat herſelf upon his Head; whereupon all the Congregation then preſent, with one Mind and Voice, choſe him for their Biſhop, in which Office he remained thirteen or fourteen Years, unto the Time of *Decius*, who commanded him, among other Chriſtians,

Chriſtians, to be put to Death, on the above-named Day, or thereabout, *Anno Domini* 250.

5. *Agnes*, a Roman Virgin and Martyr, who is commemorated by the Church of *Rome* the 21ſt of *January*.

She was a young Lady of noble Diſtinction, who ſuffered Martyrdom in the tenth general Perſecution under the Emperor *Diocleſian*, in the Year of our Lord 306. She is ſaid to have undergone her Perſecution with the greateſt Readineſs, though not above fourteen Years of Age: And though the Executioner hew'd her Body with the Sword, in a very unmerciful Manner; yet ſhe endured it with admirable Conſtancy, ſinging Hymns whilſt Life laſted.

She is pictured with a white Lamb ſtanding by her, becauſe (as the Report goes) ſhe appeared to her Parents in that Form, amidſt a Viſion of Angels, eight Days after her Execution, for which Reaſon the Roman Ladies, every Year, offer a white Lamb to St. *Agnes*, at her Altar. Theſe, the Pope takes care to have fed in the fineſt Paſture; and when they are ſheered, the Wool is ſanctified, with which fine white Cloth is made, and then conſecrated by his Holineſs. With this Cloth *Palls* are made, and ſent to every Archbiſhop, which they muſt purchaſe at a very exorbitant Price, before they can exerciſe any Authority within their own Diſtricts.

6. *Vincent*, a *Spaniſh* Deacon and Martyr, commemorated by the Church of *Rome* the 22d Day of *January*.

When *Vincent* was at *Rome* with *Euſebius*, *Peregrinus*, and *Potentianus*, *Lucius Antoninus Commodus* then Emperor, commanded the People to ſacrifice to *Hercules*, who, he ſaid, was their Patron and Defender; but *Vincent*, with the other three, taught the People to believe in and worſhip God only; which the Emperor hearing of, ordered them to be apprehended, and compelled to ſacrifice to *Hercules*, but upon their Refuſal, were preſſed to Death with great Leaden Weights.

7. King *Charles* the Martyr, ſolemnized on the 30th Day of *January*, by the Church of *England*.

He was King of *England*, and murdered by his Subjects in the Year of our Lord 1648, on the above Day, a Scaffold being erected before his Palace at *Whitehall* for that Purpoſe. His Royal Conſort was a profeſt Papiſt, but himſelf liv'd and dy'd in the Principles of the Church of *England*, according to his own Declaration made upon the Scaffold immediately before his Death, as well as by his Writings.

Note, *At the Bottom of the Calendar in the Month of* January, *there is a Direction, that the 6th Chapter of* Exodus, *which is the firſt Leſſon in the Morning for* January 30, *is to be read only to Verſe the* 14*th. The Meaning*

ing of which is, That as the Subject Matter of Diſcourſe concerning Moſes, Aaron *and* Pharaoh, *breaks off there, and the reſt of the Chapter goes on with ſome Chronological Accounts not ſo inſtructive, the Compilers of the Common Prayer gave that Direction for that Breaking off accordingly. And though this happens upon the Martyrdom of King* Charles I. *and ſo is not read at all (except that Day fall on a* Sunday) *Yet when the Legiſlative Power ſhall think proper to remove the Obſervation of that Day, it will then be read as at firſt intended.*

8. *Blaſius*, Biſhop and Martyr, celebrated on the 3d Day of *February*, by the Church of *Rome*.

What particular Place he was Biſhop of, and where he ſuffered Martyrdom, is not known at preſent; or elſe the Account remains buried in ſome ancient Records not very eaſy to come at.

9. *Agatha*, a *Sicilian* Virgin and Martyr, commemorated by the Church of *Rome* on the 5th Day of *February*.

She was ſaid to be very beautiful, which occaſioned *Quintianus*, the Governor of a Province in *Sicilia*, to fall in Love with her, but for an ignoble End: But ſhe withſtood his baſe Deſigns, for which Reaſon, and alſo for not worſhiping the Heathen Gods, he ordered her to be ſcourged and then impriſoned. — Not terrified at this, but perſiſting in the Chriſtian Faith, ſhe was afterwards put upon a Rack, which ſhe endured with great Conſtancy; was next burnt with hot Irons, and had her Breaſts cut off; after this ſhe was again impriſoned; from whence ſome little Time after, the Governor ſent for her again, imagining he ſhould be able to bring her over to his own Terms, but ſhe being already half dead, and ſuppoſing what it was that ſhe was ſent for, begged of the Almighty that he would releaſe her, by taking her to himſelf, which Petition was heard, and ſhe expired immediately, on the above Day.

10. *Valentine*, a Biſhop and Martyr, celebrated on the 14th Day of *February*, by the Church of *Rome*.

He is ſaid, on the Account of his Religion, to have been impriſoned at *Rome*, and delivered to the Care of one *Aſterius*: This *Aſterius* had a Daughter, who was blind, whom *Valentine* reſtored to Sight; and by that Means converted the whole Family. After he had been confined about a Year in Priſon, he was ordered to be brought forth on the aboveſaid Day, and publicly executed, which was done by beheading him, about the Year 271. He was poſſeſſed of very great Abilities, and was famous for his uncommon Love and Charity. Hence the Cuſtom among the young Men and Maidens of chuſing Valentines on this Day.

11. *David*

11. *David*, Archbiſhop of *Menevia* in *Wales*, commemorated on the 1ſt Day of *March*, by the Church of *Rome*.

He was Son of *Xantus*, Prince of *Wales*, by *Melearia* a Nun, and was Uncle to King *Arthur*; he was both learned and eloquent, and in his Life and Converſation very auſtere. He was made Biſhop of *Caerleon* in *Wales*, from whence removing his See to *Minevia*, it was from him ever afterwards called St. *David*'s. He built twelve Monaſteries about the Place where he lived; ſat ſixty-five Years in his See, and died *Anno Chriſti* 642, aged 146 Years. He was canonized by Pope *Calixtus* the Second, about 500 Years afterwards.

12. *Cedde* or *Chad*, Biſhop of *Litchfield*, obſerved by the Church of *Rome*, on the 2d Day of *March*.

He was made Biſhop of that See by *Egfrid*, King of *Northumberland*, in the Abſence of *Wilfride*, who was gone to *Paris* to be conſecrated Archbiſhop of *York*, by whom a ſpeedy Return was not expected. At laſt *Wilfride* returned, and then *Egfrid* was perſuaded by *Theodorus*, Archbiſhop of *Canterbury*, to reſign that See to him again; after which, he the ſaid *Chad*, led a monaſtic Life at *Leſtingeag*, till, by the ſame *Theodorus*, he was made Biſhop of *Litchfield*, under *Wolfhere*, King of *Mercia*, whom he is ſaid to have converted. He died *March* the 2d, 672.

13. *Perpetua Mauritania*, a Martyr, commemorated *March* 7, by the Church of *Rome*.

She was a Lady of Quality, and ſuffered Martyrdom about the Year 205, under the Emperor *Severus*. St. *Auſtin* ſays this Holyday was ſettled in his Time; and aſſures us that ſhe gave Suck to an Infant at the Time of her Martyrdom.

14. *Gregorius Magnus*, *i. e. Gregory* the Great, Biſhop of *Rome*, and Confeſſor, commemorated *March* 12, by the Church of *Rome*.

He is ſaid to be of noble Parentage, and to have applied himſelf to Study very early. The greateſt Part, if not the Whole of his Eſtate, he gave to the building and ſupporting of Religious Houſes. In or about the Year 590, he was conſecrated Pope, but always oppoſed the Title of Univerſal Biſhop, as blaſphemous and Antichriſtian. His Memory was every Year celebrated in *England*, when Popery had large Footing here, and perhaps may be ſo ſtill by the Roman Catholics of the preſent Time, for ſending *Auſtin* the Monk to convert the People, who at that Time were *Saxons*. He died about the Year 604, after having filled the Chair of St. *Peter*, fourteen Years, and left behind him many learned Books which are ſtill extant.

15. *Edward*

15. *Edward*, King of the *Weſt Saxons*, is by the Church of *Rome* celebrated on the 18th Day of *March*.

This *Edward* was the Son of King *Edgar*, who firſt reduced the Heptarchy into one Kingdom. He came to the Crown *Anno Domini* 975, aged about twelve Years, and enjoyed it about two or three Years, being murdered by the Order of his Mother-in-Law *Elfride*, at *Corf* Caſtle in *Dorſetſhire*, whilſt he was drinking a Cup of Wine, that her own Son *Ethelred* might come to the Throne.

From his being a Fovourer of the Monks, they made his Murder become a Martyrdom, which was appointed by Pope *Innocent* in the Year 1245, to be held yearly as a Feſtival.

16. *Benedict*, an Abbot, is commemorated by the Romiſh Church on the 21ſt Day of *March*.

He was born of an honourable Family in *Italy*, and being very devout, ſet up an Order of Monks, in or about the Year 529, which ſtill bears his Name. The Monks of his Order tell us, that he was very remarkable for Self-Mortification, and that he would frequently wrap a Heap of Briars about him, and roll in them, to put a Stop to any inordinate Deſires which at that Time ſhould ariſe within him.

There is a famous Miracle related by St. *Gregory*, concerning him, which is this; When the *Goths* invaded *Italy*, they endeavoured to burn his Cell, and himſelf in it; but the Fire would only burn round him, without doing him the leaſt Hurt; the *Goths* being enraged at this, flung him into a hot Oven, and then ſtopped it up; however the next Day they found him alive and unhurt.

17. *Richard*, Biſhop of *Chicheſter*, was commemorated by the Church of *Rome*, *April* the 3d — but for what Reaſon, is at preſent hard to determine, there being no authentic Account of the ſame that I have yet met with.

18. St. *Ambroſe*, Biſhop of *Milan*, commemorated by the Church of *Rome*, *April* the 4th.

He was born about the Year 340. One Day as he was aſleep in his Cradle, a Swarm of Bees ſettled upon it, by which ſome ventured to foretell his future Eloquence. Immediately after the Death of *Auxentius*, Biſhop of *Milan*, he was made Biſhop of that See, which he govern'd with great Vigilance and Piety, upwards of twenty Years, giving all his Mony to charitable Uſes, and ſettling the Reverſion of his Eſtate upon the Church. He died *Anno Domini* 396, aged fifty-ſeven Years, having firſt converted St. *Auguſtin*, and then baptized him in the Chriſtian Faith, at which Baptiſm it is reported,

reported, that he (*extempore*) pronounced that divine Hymn called *Te Deum*, which, in the Church of *England*, is uſed every Morning immediately after the firſt Leſſon.

19. *Alphege*, Archbiſhop of *Canterbury*, commemorated by the Church of *Rome* on the 19th Day of *April*.

He was an *Engliſhman* of noble Parentage, and led a holy but ſevere Life, which he began in his juvenile Years. He was firſt made Abbot of *Bath*, then Biſhop of *Wincheſter*, and afterwards, in the Year 996, Archbiſhop of *Canterbury*. After this, the *Danes* pretended to lay claim to a Tribute, which they ſaid was due to them from the Archbiſhop, which he refuſed to pay, for which Reaſon they ſacked and burnt the City and Church of *Canterbury*. Nine Parts in Ten of the People they put to the Sword; put the Archbiſhop in Priſon for ſeven Months, and then ſtoned him to Death at *Greenwich*, after which he was canonized for a Saint and Martyr, by the Pope, who directed the aforementioned Day to be obſerved as his Feſtival.

20. St. *George the Martyr*, obſerved by the Church of *Rome* on the 23d Day of *April*.

He was born at *Cappadocia*, and was martyr'd for being a Chriſtian, in the Year 290, under *Diocleſian* the Emperor, whom he ſerved in the Army: *Diocleſian* being angry with the Chriſtians, publiſhed an Edict againſt them, which he cauſed to be put upon the Church Doors; but *George* not wanting Courage and Reſolution, pull'd it down again, for which he ſuffered as above. How he came to be the tutelar Saint of *England* is ſuppoſed to ariſe from the following Account.

Robert, the Son of *William* the Conqueror, who was Duke of *Normandy*, was a Chriſtian, and being at War with the *Turks*, laid Siege to the City of *Antioch*, but a large Army of *Saracens* appearing, had like to have ſaved it, had it not been for St. *George*, who with a much greater Army of Chriſtians, coming down from the Hills in White, joined with *Robert*, and put the Infidels to Flight, by which Means the Chriſtians poſſeſſed themſelves of the City,

21. *The Invention of the Croſs*, commemorated on the 3d Day of *May*, by the Roman Catholics.

This is one of the fabulous Stories of that lying Church, and runs thus;

Helena, who was the Mother of *Conſtantine* the Great, having dream'd that ſhe was to go to *Jeruſalem*, and ſearch there for the Croſs of *Chriſt*, went accordingly, and when arrived

arrived in that City, procured Labourers to dig at *Golgotha*, where, after much Trouble, they found three Croſſes, and brought them to *Helena*, who preſently conjectured they were the very Croſſes on which our Saviour and the two Thieves were crucified. However, not being able to determine which was the Croſs of *Chriſt*, ſhe ordered a dead Body to be put to each of them; two of them producing no Effect, the dead Body revived at the third, which entirely convinced her, that *that* was the Croſs ſought for.

As ſoon as the Miracle became public, every body was deſirous of having a Piece of it, that it might be preſerved as a precious Relique, whereby, in the Time of *Paulinus*, Biſhop of *Nola*, in the Year 420, it appeared that the Quantity of Reliques, when put together, made more Wood than the original Croſs was made of; to ſolve which Difficulty we are inform'd by that Father, that it was increaſed miraculouſly.

22. St. *John the Evangeliſt*, ante portam Latinam, celebrated by the Church of *Rome* on the 6th Day of *May*.

St. *John* the Evangeliſt being intended to be made a Sacrifice to the Rage of the Emperor *Domitian*, was put into a Caldron of boiling or burning Oil, as has been before related, before the *Porta Latina*, but was miraculouſly delivered from the ſame, by which Means he had the Honour of Martyrdom, without enduring the Torments of it. Hence the abovenamed Day was celebrated in Memory of that Evangeliſt.

23. *Dunſtan*, Archbiſhop of *Canterbury*, has by the Church of *Rome*, the 19th Day of *May* conſecrated to him.

He is ſaid to have been nearly related to King *Athelſton*; and by his ſuperior Knowledge in the Arts and Sciences of thoſe Times, was thought to be a Conjurer; however he was canoniz'd for a Saint. He was Confeſſor to four Kings of the *Weſt Saxons* ſucceſſively; and being ſtout in the Cauſe of Chriſt, was fearleſs in reproving any of them.

By King *Edgar* he was promoted to the See of *Worceſter*, then to *London*, and after that to *Canterbury*, in which See he ſat twenty-ſeven Years, and deceaſed on the aboveſaid Day, *Anno Domini* 988.

24. *Auguſtine*, firſt Archbiſhop of *Canterbury*, has the 26th Day of *May* dedicated to him, by the Church of *Rome*.

When Pope *Gregory* the Great was minded to convert the *Saxons*, he ſent over the juſt named St. *Auguſtine* for that Purpoſe, from whence he obtained the Name of the Apoſtle of the *Engliſh*. During his Reſidence in *England*, he was made Archbiſhop of *Canterbury*, in the Year 596, and died *May* 29, 610.

25. *Venerable*

25. *Venerable Bede*, a Preſbyter or Prieſt, celebrated on the 27th Day of *May*, by the Church of *Rome*.

He was born at *Yarrow* in *Northumberland*, *Anno* 673, and was educated, among other Branches of Literature, in the *Greek* and *Latin* Languages, wherein he ſucceeded beyond moſt of his Age, and left ſeveral Philoſophical and Mathemacal Tracts behind him, together with his celebrated Eccleſiaſtical Hiſtory of the *Saxons*.

Being only a Monk, he had a Cell allotted him, in which he ſtudied ſo many Hours every Day, that it was reported he never went out of it. However that was, it is certain no Preferment at *Rome* could prevail upon him to leave it. The Name *Venerable* was given him on the Account of his Learning and Piety.

26. King *Charles* the Second, his Nativity and Return, commemorated on the 29th Day of *May*, by the Church of *England*.

On this Day King *Charles* the Second was born, and on the ſame Day many Years after, he was reſtored to the Throne of *England*, after a long Train of Afflictions, occaſioned by thoſe wicked Regicides, who had been the inhuman Inſtruments of putting his Father to Death.

27. *Nicomede*, a Roman Prieſt and Martyr, is commemorated on the 1ſt Day of *June*, by the Church of *Rome*.

He is ſaid to have been one of St. *Peter*'s Diſciples, and by his having the Courage to bury the Remains of one *Felicula*, a Martyr, was diſcovered to be a Chriſtian.

At laſt he was martyr'd himſelf, for his Religion, being beaten to Death with Leaden Plummets, in the Reign of the Tyrant *Domitian*.

28. *Boniface*, Biſhop of *Mentz*, and Martyr, commemorated on the 5th Day of *June*, by the Church of *Rome*.

He was born in *England*, being at the firſt called *Winifrid*. Pope *Gregory* the Second ſent him into *Germany*, to convert that People, and ſo he obtain'd the Name of the Apoſtle of *Germany*. He ſucceeded to the See of *Mentz*, in the Year 745, being one of the moſt conſiderable Men of his Time, and alſo a great Admirer of *Bede*. While he was in *France*, extending the Kingdom of Chriſt, he was murdered by the Populace, at or near *Utretch*, in the Year 755.

29. St. *Alban*, Martyr, celebrated on the 17th Day of *June*, by the Church of *Rome*.

Amphialus, a Prieſt of *Caerleon* in *Wales*, being perſecuted, fled into *England*, and met St. *Alban* at *Verulum* in *Hertfordſhire*,

ſhire, who entertain'd him ſecretly. But ſoon after, a ſtrict Search being made for *Amphialus*, St. *Alban* contrived his Eſcape, which the Pagans highly reſented; wherefore to be revenged on him for ſo doing, they endeavoured to make him ſacrifice to their Idols, but he would not, for which Reaſon they put him to Death.

30. *Tranſlation* of *Edward*, King of the *Weſt Saxons*, obſerved by the Church of *Rome*, on the 20th Day of *June*.

He was murdered by his Mother-in-Law, as before obſerved, p. 39, and then buried privately at *Warham*; but three Years after, Duke *Alferus* cauſed him to be carried to *Shaftſbury*, where he was interred with great Pomp on the aboveſaid Day.

31. *Viſitation* of the Bleſſed Virgin *Mary*, obſerved by the Church of *Rome*, *July* the 2d.

Sacred Writ (*Luke* i. 39.) informs us of a Journey into the Hill-Country, made in Haſte by the Virgin *Mary*, to viſit her Couſin *Elizabeth*, who was then great with Child of *John* the Baptiſt. This famous Journey was thought on by Pope *Woban*, who inſtituted a Feaſt in Honour of it; the End of which was, that he might obtain her Interceſſion, in order that the Schiſms made by the *French* and *Italians* might be removed.

32. The *Tranſlation* of St. *Martin*, Biſhop and Confeſſor, commemorated on the 4th Day of *July*, by the Roman Catholics.

He was born in *Pononia*, and bred up a Soldier; afterwards he went into ſacred Orders, and at Length was conſecrated Biſhop of *Tours* in *France*. His Enmity to Paganiſm was manifeſted by his throwing down their Heathen Images and Altars, whenever they came in his Way. He ſat twenty-ſix Years in that See, and deceaſed *Anno Chriſti* 400.

His Helmet (for in thoſe Days Helmets were worn in the Field of Battle) was ſo much valued by the *French*, that they carried it with them into the Field, which being placed on High, ſerved to animate their Soldiers in order to obtain a Victory.

33. *Swithun*, Biſhop of *Wincheſter*, tranſlated on the 15th Day of *July*, and therefore that Day is held ſacred to him by the Church of *Rome*.

There was at that Time a Convent in *Wincheſter*, of which St. *Swithun* was firſt a Monk, and afterwards a Prior. When *Helinſtan*, Biſhop of that See died, by the Favour of *Ethelwolph* St. *Swithun* ſucceeded him, *Anno Domini* 852; in which See he

he ſat eleven Years, and then died. By his Will he directed that he might not be buried within the Church (it being cuſtomary at that Time to bury Biſhops in the Church) but in the Church-yard. However, it is ſaid a Tranſlation was made of his Remains (but where we know not) and a Chapel built over his Grave.

34. *Margaret*, Virgin and Martyr at *Antioch*, who is celebrated on the 20th Day of *July*, by the Church of *Rome*.

She was the Daughter of an Heathen Prieſt, and born at *Antioch*. *Olybius*, a Heathen *Roman*, would have married her, but perceiving her to be a Chriſtian, declined it, endeavouring in the mean Time to bring her over to the heatheniſh Religion again: But finding her ſtrong in the Faith of *Chriſt*, and conſequently himſelf unable to overthrow her by Argument, he uſed her very cruelly, and then put an End to her Pain, by taking off her Head, *Anno Chriſti* 278.

She is invoked by the Roman Catholics to aſſiſt Women in the Time of their Labour.

35. St. *Mary Magdalene*, commemorated on the 22d Day of *July*, by the Church of *Rome*.

It has been a Doubt with ſome, eſpecially the laſt Compilers of the Common Prayer, whether this *Mary Magdalene*, was the ſame with her mentioned in the 7th Chapter of St. *Luke*, *v.* 37, *&c.* and therefore, though this Day was celebrated according to the Common Prayer Book, in the Time of *Edward* VI. yet the laſt Reformers thought proper to diſcontinue the Service, and only left her Name in the Calendar.

36. St. *Anne*, Mother to the Bleſſed Virgin *Mary* celebrated on the 26th Day of *July*, by the Roman Catholics.

This Day is ſet apart by the Roman Catholics for nothing that we know of, but, the Birth of St. *Anne*.

37. *Lammas-Day*, celebrated by the *Roman Catholics*, on the 1ſt Day of *Auguſt*.

Many Papiſts had a fooliſh Conceit that St. *Peter* was the Patron of the Lambs and Sheep, becauſe our Saviour ſaid to him, feed my Lambs, and feed my Sheep; and therefore they thought that the Maſs celebrated on this Day was ſerviceable to their Lambs and Sheep, by making them thrive. It is alſo ſaid to be obſerved upon the Account of St. *Peter*'s Impriſonment, and known by the Name of St. *Peter in the Fetters*. But however all this is, there are ſome People, who, perhaps with greater Probability, derive the Expreſſion from an ancient *Saxon* Word, ſignifying Loaf-Maſs; becauſe the *Saxons* uſed

uſed on that Day, to offer to their Deities, ſome new Loaves made of the firſt Fruits of their new Wheat.

38. *Transfiguration of our Lord*, has the 6th Day of *Auguſt* dedicated to it by the Church of *Rome*.

This was inſtituted by Pope *Calixtus*, *Anno Domini* 1455, and therefore, of late Date, among the Roman Catholics; but whether this was really the Day on which our Saviour was transfigured on the Mount, *Matt.* xvii. 2, is at this Time very hard to affirm.

39. *Name of Jeſus*, hath the 7th Day of *Auguſt* dedicated to it; but by whom, or for what Reaſon, no body can determine. Formerly it was ſaid to be dedicated to one *Afra* of *Crete*, who was converted by *Narciſſus*, Biſhop of *Jeruſalem*, and was martyr'd on this Day.

40. St. *Laurence*, Arch Deacon of *Rome*, and Martyr, celebrated on the 10th Day of *Auguſt*, by the *Roman Catholics*.

He was born in *Spain*, and in Length of Time, was made Arch Deacon and Treaſurer of the Church of *Rome*, under Pope *Sixtus*, about the Year 259.

In the Time of *Valerian* the Emperor, *Sixtus* was perſecuted, and the Soldiers uſing him very ſeverely, occaſioned St. *Laurence* to abide by him, even to the Place of Execution.

Not long after the Death of *Sixtus*, the loweſt Part of the Pagans accuſed *Laurence* of ſecreting the Treaſure of the Church, becauſe he did not deliver it up to them; for which Reaſon they laid him on a Gridiron, and broil'd him over a ſlow Fire, during which Time, his Behaviour was remarkably courageous and reſolute; for having laid ſome Time on one Side, he called to his envious and inhuman Tormentors, to turn him on the other Side, that being broil'd enough; adding, that he received more Comfort than Pain; for however great his Pain might be, ariſing from the Fire; his Comfort was abundantly greater by his dying for the Cauſe of Chriſt.

In after Ages, the Empreſs *Pulcheria* built a Temple in Memory of him, which was afterwards enlarged by *Juſtinian*, or wholly rebuilt by him. In this Church, it is ſaid, was preſerved the aforementioned Gridiron, which the too credulous St. *Gregory* affirmed to have been productive of many Miracles.

41. St. *Auſtin*, Biſhop of *Hippo*, Confeſſor and Doctor, has the 28th Day of *Auguſt* dedicated to him.

His Birth-Place was at *Togalle* in *Numidia*, a Province in *Africa*, *Anno Chriſti* 354. At firſt he is ſaid to have ſtudied *Poetry*,

Poetry, *Plays*, *Rhetoric* and *Philoſophy*, in which he became a Profeſſor at *Rome*, and next at *Milan*. During his Studies at *Milan* he became acquainted with St. *Ambroſe*, and was by him inſtructed in Divinity, which he here ſtudied. About the Year 391, he was conſecrated Biſhop of *Hippo*, which See he filled with Honour, being a judicious Divine: and died *Anno Domini* 430, aged 77 Years.

42. *Beheading of John the Baptiſt*; a Romiſh Feſtival, celebrated on the 29th Day of *Auguſt*.

At firſt it was called, *The Feaſt of gathering up the Relics of St. John the Baptiſt*, but afterwards the Feaſt of his *Beheading*.

In the 4th Century, ſome of his Remains were ſaid to be productive of ſeveral Miracles; at the hearing of which, *Julian* the Apoſtate, order'd them to be burnt, but ſome of them were ſecretly preſerved. In the Time of the Emperor *Valens*, his Head was found, or ſaid to be ſo, and as a precious Relic, carefully placed in the Church at *Conſtantinople*.

43. *Giles*, Abbot and Confeſſor, has the 1ſt Day of *September* dedicated to him.

He was born an *Athenian*, and being brought up in the Chriſtian Religion, diſpoſed of his Patrimony to charitable Uſes. He travelled into *France* in the Year 715, and lived two Years with *Cæſarius*, Biſhop of *Arles*; after which he led a Hermit's Life, till an Abby was built for him at *Niſmes*, by the King of *France*, of which he was made Abbot. He departed this Life *Anno Domini* 795.

44. *Fire of London*, obſerved *September* 2d, by the Inhabitants of *London* only.

It broke out at a Houſe in *Pudding-Lane* on *September* 2d, 1666, on a *Saturday* Night, about Midnight, and in three Days conſumed 13200 Houſes (which compoſed 400 Streets) the Cathedral Church of St. *Paul*, 86 Pariſh-Churches, 6 Chapels, *Guildhall*, the *Royal Exchange*, *Cuſtom-Houſe*, *Blackwell-Hall*, 52 of the Company's Halls, 3 City Gates, 4 Stone Bridges, and the Priſons of *Newgate* and the *Fleet*; alſo the *Poultry* and *Woodſtreet* Compters; all which ſtood on 436 Acres of Ground; the Loſs of which amounted to upwards of 10730500*l*. 6 Perſons only periſhing in the Flames. Afterward this City was rebuilt, and on that Houſe where the Fire began, was by Authority the following Inſcription.

Here by Permiſſion of Heaven, Hell broke looſe upon this Proteſtant City, from the malicious Hearts of barbarous Papiſts, by the Hand of their Agent Hubert, *who confeſſ'd, and on the Ruins of this Place declared the Fact for which he was hanged*, viz. *That here*

here began the dreadful Fire, which is described and perpetuated on and by the neighbouring Pillar [Monument] *erected Anno* 1680, *in the Mayoralty of Sir* Patience Ward, *Knt.* This Inscription has some Time since been taken away.

45. *Enurchus*, Bishop of *Orleans* in *France*, has the 7th Day of *September* dedicated to him, by the *Roman Catholics*.

He was present at the Council of *Valencia*, *Anno Domini* 375; and we are informed that within the Space of three Days he converted 7000 Infidels to the Christian Faith.

46. *The Nativity of the Blessed Virgin Mary*, is a high Festival among the *Roman Catholics*, and solemnized on the 8th Day of *September*.

It is affirm'd that a Choir of Angels were heard singing in the Air on that Day, and therefore in after Ages, it was appointed by the Church of *Rome* to be kept holy, but the Truth of the Affirmation is very much to be doubted.

47. *Holy Cross-Day*, sometimes called Holy-rood Day, observed by the *Roman Catholics* on the 10th Day of *September*. The Occasion of it is as follows; *viz.*

In the Year 615, *Cosroës* King of *Persia*, plundered *Jerusalem*, and among other Things, carried away a Piece of the Cross, which *Helena* had left there: And when in his Cups, or otherwise merrily disposed, would always divert himself with that and the holy Trinity. After this *Heraclitus* the Emperor commenced a War against him, and defeated him; by which Means he recovered the Piece of the *Cross*, and brought it back again in Triumph to *Jerusalem*; but instead of entering the City, he found the Gates shut against him, not by the Contrivance of Man, but by the Arm of Heaven (if you will believe it) and heard a Voice which said, *the King of Kings did not enter into that City in so stately a Manner, but meek and lowly, riding upon an Ass.* Whereupon the Emperor immediately left his Horse, and (for want of an Ass) went into the City barefoot, carrying the Wood of the *Cross* upon his Shoulder, which gave Rise to this Festival: *which ought to be laught at by every honest Protestant.*

48. *Lambert*, Bishop and Martyr, a Festival held on the 17th Day of *September* in Honour of him.

He was, in the Time of King *Pepin* I. Bishop of *Utrecht*; and observing some Lewdness in the King's Grandson, reproved him for it, for which Reason one of his Concubines murder'd the good Bishop herself, or order'd him so to be served. *Robert*, Bishop of *Leeds*, procured this Day to be solemnized with a Festival in Honour of him, *Anno Christi* 1240.

49. *St.*

49. *St. Cyprian*, Archbiſhop of *Canterbury*, and Martyr, has the 26th Day of *September* dedicated to him.

After he was converted from Idolatry, he gave all his Riches to the Poor; and having been made Biſhop of *Carthage*, *Anno Domini* 248, ſat in that See ten Years, and then ſuffered Martyrdom.

50. *St. Jerome of Prague*, Confeſſor and Doctor, has the 30th Day of *September* dedicated to him.

In his Youth he diſcover'd great Parts, and was ſent to *Rome* to ſtudy Rhetoric, where he behaved ſo well, as to gain the Favour of Pope *Damaſcus*, and be made his Secretary. Here it was that he was converted and baptized; after which he ſtudied Divinity, and made himſelf Maſter of the *Hebrew* Language. The greater Part of his Time by far, he ſpent at *Bethlehem*, in cloſe Retirement, and hard ſtudy, where, it is ſaid he tranſlated the Bible. He died *Anno* 422, aged 80 Years.

50. *Remigius* Biſhop of *Rhemes*, has the 1ſt Day of *October* dedicated to him, probably upon Account of his Death.

He ſtands recorded for Learning and Piety; and converted *Clodoveus*, the then King of *France*, together with a great Part of his Kingdom, for which he is ſtyled the Apoſtle of *France*. He held his See ſeventy-four Years with Honour, and died in the 96th Year of his Age, *Anno* 535. A certain Cruſe, which he uſed to put Water in, is to this Day preſerved; out of which the Kings of *France* are uſually anointed at their Coronation.

52. *Faith*, Virgin and Martyr; commemorated on the 6th Day of *October* by the *Roman Catholics*.

Her Birth-place was *Pais de Gavre* in *France*, ſhe was perſecuted about the Year 290, and ſuffered very cruel Torments, and at laſt Death itſelf for the Sake of *Chriſt*.

53. *St. Denys* the Areopagite, Biſhop and Martyr, commemorated on the 9th Day of *October*, by the Church of *Rome*.

He was converted by St. *Paul*, while he was at *Athens*, his Name then being *Dionyſius*, as mentioned *Acts* xvii. 34, but for what Reaſon it was afterwards changed, is not eaſily known, except by Corruption. After he was converted, he made Divinity his Study, in which he ſucceeded ſo well, as after he had entered into holy Orders, to be made Biſhop of *Athens*, at which Place, for the ſake of Chriſt, he choſe to become a Martyr. In *France* he is admitted as the Tutelar Saint of that Kingdom, he being the firſt that preached the glad Tydings of the Goſpel there.

54. *Tranſlation*

54. *Tranſlation of King Edward the Confeſſor*, celebrated on the 13th Day of *October*, by the *Roman Catholics*.

He was the youngeſt Son of King *Ethelred*, and came to the Crown of *England*, *Anno* 1042. During his Reign, he was very induſtrious to have wholeſome Laws, and therefore collected all the moſt uſeful of the *Daniſh* and *Saxon* Laws that he could meet with, and incorporated them among the Laws of *England*. By him was ſettled that Collection called* *Peter-Pence*, for which he obtained of the Pope, then in being, the Character of Confeſſor. Many Miracles were ſaid to be done by him and his Veſtments together, which by the Monks are (if they have any of them) eſteemed holy. His Crown, Chair, Staff, Spurs, *&c.* are all of them uſed at the ſeveral Coronations of our Kings of *England*.

* Note, *It was called* Peter-Pence *becauſe made on the 1ſt Day of* Auguſt, *called* St. Peter ad vincula, *or* St. Peter in the Fetters *aforementioned, by every Houſe paying a Penny, which was ſaid to be for the Uſe of the* Engliſh *School, or College, at* Rome. *It was prohibited by King* Edward *the Third: Afterwards, in a ſucceeding Reign it was revived: but at laſt it was wholly abrogated by Queen* Elizabeth, *in the firſt Year of her Reign.*

55. *Etheldred*, a Virgin, has the 17th Day of *October* dedicated to her, by the Church of *Rome*.

She was twice married; firſt to *Torſbert*, a Nobleman in *Lincolnſhire*, and after his Death to King *Egfrid*, *Anno* 671, or thereabout, without being known by either of them; ſhe having Pretenſions to a holy Life. After ſtaying twelve Years at Court, ſhe obtain'd Leave to go to the Abbey at *Coldingham*, in the County of *Mers* in *Scotland*, where ſhe became a Nun, under the Direction of the Abbeſs *Ebba*, Daughter of King *Ethelfrida*. After this ſhe cauſed an Abbey to be built at her own Expenſe, of which ſhe became Abbeſs herſelf, and died and was buried there.

56. *Criſpin*, Martyr, who ſtands commemorated on the 25th Day of *October*, by the Roman Catholics.

He was born at *Rome*, and by Trade a Shoemaker. *Criſpin* with his Brother *Criſpianus*, who was of the ſame Trade, travelled from *Rome* to *Soiſſons* in *France*, about the Year 303, to enlarge the Kingdom of Chriſt, by preaching his Doctrin. Like St. *Paul*, they work'd at their own Trade for a Maintenance, that they *might not be chargeable to others*. However, the Governor of the Town, having no Reliſh to the Chriſtian Religion, laid Hands on them, and order'd them to be beheaded.

The Shoemakers in *England*, of what Religion ſoever, and very likely in all *Romiſh* Places, chooſe him for their Tutelar Saint.

57. *All Souls*, commemorated on the 2d Day of *November*, by the Church of *Rome*. This is not mentioned in our Calendar, but only in ſome of our Almanacks; and therefore for the Oddity of it, I have inſerted the Story, which runs thus.

A certain Monk went to pay a Viſit to *Jeruſalem*, and in his Return Home, his Curioſity led him to ſee Mount *Ætna*, which, by ſome, was imagined to be the Mouth of Hell. When he arrived there, he heard a horrid Noiſe; but however could eaſily diſtinguiſh the Complaints which ſeveral Devils made there, of many Souls, when delivered into their Cuſtody, were taken from them again by the Prayers of ſome Monks. When he came Home, he related this Affair to an Abbot of his Acquaintance, who from that Time order'd the aboveſaid Day to be annually kept in his Monaſtery, and Prayers to be offered up for all departed Souls. This coming to the Pope's Ear, he afterwards order'd it to be obſerved as a ſolemn Feſtival. *This is one of the Deceits of the Church of* Rome, *from which I hope God Almighty will always keep us.*

58. *Gunpowder Plot*, obſerved on the 5th Day of *November*, by the Church of *England*.

This was one of the wicked Contrivances of the Roman Catholics, in the Time of King *James* I, to deſtroy at once both the King, and the two Houſes of Parliament, in full Aſſembly. *Cateſby* was at the Head of this Helliſh Body, and *Guy Fawkes*, was to have ſet Fire to the Train; thirty-ſix Barrels of Gunpowder being conveyed under the Houſe of Lords for that Purpoſe.

Note, *The Kingdom of* England *has received ſeveral very ſignal Deliverances from Papal Tyranny; would to God the People may make a right Uſe of theſe Deliverances, by adhering more ſtrictly to the Principles of that Church in Oppoſition to the Church of* Rome.

59. *Leonard*, Confeſſor, has the 6th Day of *November* dedicated to him by the Roman Catholics.

He was firſt made *Biſhop* of *Rhemes*, and afterwards of *Limoſin*; both of them in *France*; and obtained of *Clodius*, then King of *France*, and the ſecond King, the Liberty of ſetting ſuch Priſoners free, as he ſhould think fit to viſit. Upon the which, he ſpared no Pains (for the ſake of the Chriſtian Religion) of viſiting all that were under any Confinement, by which Means, in all Probability, he gain'd many Proſelytes to Chriſt, as well as a Remittance from their Impriſonment. He deceaſed about the Year 500, and 'tis

ſaid

ſaid has been, and likely is ſtill acknowledged by the *Roman Catholic* Priſoners, as their Tutelar Saint.

60. St. *Martin*, Biſhop and Confeſſor; his Death is commemorated on the 11th Day of *November*, by the *Roman Catholics*, and is called Martin-Maſs; ſee No. 32, on the 4th of *July* foregoing.

61. *Britius*, Biſhop, has the 13th Day of *November* dedicated to him by the Church of *Rome*.

He ſucceeded St. *Martin* in the See of *Tours*, about the Year 432. The Occaſion of this Day being devoted to him, might probably proceed from his Deceaſe on the ſame Day.

62. *Machutus*, Biſhop, is commemorated on the 15th Day of *November*, by the Church of *Rome*.

He was Biſhop of St. *Maloes* in *France*, and is ſaid to have wrought many Miracles; but we are not obliged to believe all that the *Roman Catholics* ſay. He lived about the Year 500, and very likely has the aboveſaid Day dedicated to him as the Day of his Death.

63. *Hugh*, Biſhop of *Lincoln*, has the 17th Day of *November* dedicated to him by the *Roman Catholics*.

He was a Man famous for Abſtinence and Auſterity; and was made Prior of the *Carthuſian* Convent at *Wittenham* in *Somerſetſhire*, and afterwards Biſhop of *Lincoln*, both by King *Henry* the Second. Being under an Obligation of coming up to *London* in 1200, he was ſeized with a Quartan Ague, of which he died on the Day above-mentioned. His Remains were laid in the Cathedral at *Lincoln*, with a great deal of Pomp and Solemnity. About twenty Years afterwards the Appellative *Saint* was given to him at *Rome*; and about ſixty-two Years after that his Body was put into a Silver Shrine.

64. *Edmund*, King and Martyr, has the 20th Day of *November* dedicated to him.

He was King of a People called the *Eaſt Angles*, including *Norfolk*, and the neighbouring Parts, in *England*. The *Danes* making ſome Incurſions in his Territories, gave him and his People a great deal of Trouble: At Length, finding it not in his Power to overcome them, he made an Offer of himſelf to them, if they would let his Subjects remain in Peace; but the *Danes* perceiving their Strength to be greater than his, rejected his Offer; and as ſoon as they became Conquerors, made *Edmund* their Priſoner. The next Attempt was to bring him over to their Religion (he being a Chriſtian, and they Idolaters) but on his refuſing, they beat him ſeverely;

then he was ſcourged; and laſt of all they ſhot him to Death with Arrows. His Body was buried at St. *Edmund's Bury* in *Suffolk*, which Town, in Proceſs of Time, derived its Name from him, it being only called *Bury* before.

65. *Cecilia*, a Virgin and Martyr, has the 22d Day of *November* devoted to her Service, by the Church of *Rome*.

She was a Roman Lady, and a Chriſtian. Being perſecuted, ſhe was required to renounce her Religion, but having Courage enough to refuſe their Demand, and acknowledge Chriſt for her Saviour, ſhe was put into a large Veſſel of boiling Water, in which ſhe expired. Yet there are ſome who ſay ſhe was ſuffocated in a warm Bath, the Air being ſhut out. She fell a Sacrifice to the Enemies of the Chriſtian Religion *Anno* 225, probably on the aboveſaid Day.

66. St. *Clement* I. Biſhop of *Rome*, and Martyr, has the 23d Day of *November* dedicated to him by the Church of *Rome*.

He was by Birth a Roman, and a very early Biſhop of that Place, being one of the firſt of them; which See he held about ſeventeen Years. His Writings were very much eſteemed by the Primitive Chriſtians. Being perſecuted for his Religion, he was condemned to the Mines, there to hew Stones; but this being thought not Puniſhment enough, inaſmuch as he preached the Goſpel to the reſt of the Miners; he had an Anchor faſtened to his Neck, with which he was thrown into the Sea and drowned.

67. *Catherine*, Virgin and Martyr, has the 25th Day of *November* conſecrated to her, by the Church of *Rome*.

She was born at *Alexandria*, and brought over to the Chriſtian Religion about the Year 305, which ſhe profeſſed with the utmoſt Reſolution. Her Courage was ſo great, that ſhe durſt openly reprove the idolatrous People, for their Sacrifices, and upbraided the Emperor *Maxenlius* to his Face, for his Cruelty; for all which ſhe was condemned to die, by having a great Wheel, ſtuck full of Spikes, with the Points outward, rolled over her Body; which very likely gave Birth to what is now commonly called the *Catherine-Wheel*.

68. *Nicholas*, Biſhop of *Myra* in *Lycia*, is commemorated on the 6th Day of *December*, by the Church of *Rome*.

He was remarkable for his great Charity; and the following Narrative will ſufficiently diſcover him to have been ſuch an one. A certain Man having three Daughters, who were young Women, was fallen to decay; and not knowing immediately what Courſe to take for an honeſt Livelihood; the Girls were tempted to proſtitute themſelves, that they might thereby

thereby maintain themſelves and their Father. The good Biſhop hearing of this, ordered a Sum of Mony to be given to the Father, that they might live virtuouſly.

69. *Conception of the Bleſſed Virgin Mary:* She is commemorated on the 8th Day of *December*, by the Church of *Rome*.

When the Fleet of *William* the Conqueror had been at Sea in a Storm, and come ſafe home again, then it was, and upon that Occaſion, that *Anſelm*, Archbiſhop of *Canterbury*, inſtituted this Feſtival.

70. *Lucy*, Virgin and Martyr, celebrated on the 13th Day of *December*, by the Church of *Rome*.

She was a young Lady of *Syracuſe*, who preferred a Virgin State to that of Matrimony. Being ſolicited by a young Gentleman to become his Wife, ſhe refuſed him; and to avoid any further Addreſſes, gave her Fortune to the Poor; at which being greatly vex'd, he went to a Heathen Judge, and accuſed her of being a Chriſtian. The Judge ordered her to be diſhonoured in a Brothel-Houſe (ſuch being allowed by Law) but in her Way thither, ſhe ſo provoked the Officers by ſtruggling with them, that they uſed her very barbarouſly, and then killed her, about the Year 305.

71. *O Sapientia*, *December* 16.

This Day, and the following, to *Chriſtmas-Eve*, were conſecrated by the Church of *Rome*, to the Honour of the Advent of *Chriſt*; hence a Latin Anthem, beginning with *O Sapientia*, uſed to be ſung on thoſe Days; the firſt Day beginning as above.

72. *Silveſter*, Biſhop of *Rome*, has *December* 31ſt dedicated to him by the Church of *Rome*.

He came to the See of *Rome* in the Year 314, and is ſaid to have invented ſeveral Rites and Ceremonies, which are now practiſed, ſuch as *Aſylums*, *Unctions*, *Palls*, *Corporals*, *Mitres*, *&c.* He went off the Stage of Life *Anno* 334.

Miſcellaneous Arithmetic:

OR A FULL

ACCOUNT of the NEW CALENDAR, &c.

PART II.

A DISSERTATION

CONCERNING

Years, Months, Weeks, Days, Hours, Minutes and Seconds;

And the Manner of their being ſettled in the World, for the better Computation of Time.

I. Of the YEAR.

A *YEAR* is the principal and moſt ordinary Part of Time, whereby not only the Ages of Men, of the World, and of other Things, but alſo of the Times of almoſt all Actions in the World, *viz.* Their Beginnings, Progreſs, Durations, and Intervals, are meaſured and numbered.

It is a periodical Revolution, or a great Circle of Months and Days, in which the four Seaſons, *Spring*, *Summer*, *Autumn* and *Winter*, are, after one Revolution of the Sun, ordained to return in their Courſes.

It is called *Annus*, from *Annulus*, a Ring; becauſe a Motion in a Ring finiſhed, begins again without End: Or, it may be, from *Anguis*, a Snake; becauſe the *Egyptians*, before they had the Uſe of Letters, repreſented it by a Serpent, or Snake, biting her own Tail.

The *Year* is of two Sorts, Aſtronomical and Political.

The aſtronomical Year is two fold, *viz.* *Solar* and *Lunar*.

The *Solar Year* is either *Natural* or *Sydereal.*

The *natural Year* is that Space of Time, which the Sun takes up in departing from any one Point of the Ecliptic, to his Return to the ſame Point again, whether the Point be *Tropical, Equinoctial,* or *Solſticial.* This Motion is two-fold, viz. *mean* and *true.*

Note, *It is called* natural, *becauſe it ſeems to be deſtinated by* Nature *for the Menſuration of Time.*

The *mean Motion* of the Sun is aſcribed to the *mean Equinox,* or *Solſtice,* and contains 365 Days, 5 Hours, 48 Minutes, 55 Seconds; and this is the ſtanding Rule and Level for the Length of the Year.

The *true Motion* (called alſo apparent and unequal) is aſcribed to the true *Equinox* or *Solſtice, i. e.* It is the Space of Time, in which the Son, by his Motion, according to the Succeſſion of the Signs, returns to the true *Equinox* or *Solſtice,* and this increaſeth or decreaſeth according to the ſwifter or ſlower Progreſs of the *Equinoctial* or *Solſticial Points*; and contains in its greateſt Quantity 365 Days, 5 Hours, 56 Minutes, 53 Seconds; but in the leaſt Quantity 365 Days, 5 Hours, 24 Minutes, 38 Seconds.

The *Sydereal Year* is that Space of Time in which the Sun returns to the ſame Star, whether fixed or erratical, *i. e.* planetary, from whence it departed; and this is either fixed or moveable.

The fixed *Sydereal Year* is referred to the fixed Stars, whoſe Quantity is invariable; being according to *Copernicus* 365 Days, 6 Hours, 9 Minutes, 40 Seconds.

The moveable *Sydereal Year* is referred to any one of the Planets: The mean Quantity of Time being in Proportion to ſuch Planet's Diſtance from the Sun, but inverſely. Thus the mean Quantity of a *Sydereal Year* with *Saturn,* which is the moſt diſtant, is 378 Days, 2 Hours, 12 Minutes, 13 Seconds; with *Jupiter* (which is next nearer) it is 398 Days, 21 Hours, 12 Minutes, 9 Seconds; with *Mars* (which is next nearer to *Jupiter*) it is 779 Days, 22 Hours, 40 Minutes, *&c.*

The *Lunar Year,* is that wherein the Moon, after ſeveral Conjunctions with the Sun, as it were, meets and unites with him again, at or near the ſame Point in the Heavens, where they appeared together before; and this is two-fold, *viz.* Common and Emboliſmal, and each of theſe is either *mean* or *true.*

The mean *common Lunar Year,* contains 12 ſynodical Lunations, or 354 Days, 8 Hours, 48 Minutes, 38 Seconds, and this is the Rule of all the civil *Lunar Years.* The

The mean *emboliſmal Lunar Year*, contains 13 ſuch Lunations, or 383 Days, 21 Hours, 32 Minutes, 41 Seconds.

The *Political* or *Civil Year*, is ſuch as is every where uſed for Diſtinction of Time; wherein a Reſpect is had,

1. To the Sun alone.
2. To the Moon alone. Or,
3. To the Sun and Moon together.

1. The *Political* or *Civil Year* was framed by the Sun.

The *Egyptians*, by this Luminary, made their Year to conſiſt of 365 Days exactly, and began their Year at the Noon of the firſt Day of their firſt Month *Thoth*. They had 12 Months, each containing 30 Days; and at the End, they always added 5 Days more to compleat the Year, by which Means the Sun was nearly brought to the ſame Place again as at firſt. But becauſe they made no Reckoning of the odd 6 Hours, whereby the Year exceeded 365 Days, by that Means it anticipated one Day in every four Years, and cauſed the firſt Day of their Year, which was fixed to neither *Equinox* nor *Solſtice*, to wander through all the Seaſons of the Year.

The *Hebrews* obſerved the like Year before the *Alexandrian Æra*, but with this Difference, that they intercalated, or added, one whole Month of 30 Days, at the End of every 120 Years: For they perceiving that the Year was too ſhort by 6 Hours, were contented to ſtay ſo long, and then an intire Month of thirty Days was added, by which Means they brought the Sun nearer to his former Place than the *Egyptians*.

The *Hebrews* had alſo a two-fold Year, viz. *Eccleſiaſtical* and *Civil*. Their *Eccleſiaſtical Year* began from the new Moon next the *Vernal Equinox*, in the Month *Niſan*; and the *Civil* began from the new Moon next the *Autumnal Equinox*, in the Month *Tiſri*.

The *Perſians* uſed the ſame Year with the *Egyptians*, *viz.* 365 Days, and began it with the firſt Day of their firſt Month *Pharawardin*, exactly agreeable with *Chæac*, the fourth Month of the *Egyptians*, which alſo wandered through the ſeveral Seaſons of the Year. They reckoned from the Æra of *Jeſdegird*, which was *Anno Chriſti* 632, unto the *Galalean* Year, which was *Anno Chriſti* 1079, equal to 447 *Egyptian* Years; after which Time the *Perſians* obſerved that their Year was too ſmall, and that the Days of the Month anticipated by little and little; and therefore, by the Authority of the Emperor *Alb. Arſalem*, they inſtituted an Emendation thereof, beginning at the *Vernal Equinox*, and to the fourth Year, for the

moſt Part, and ſometimes alſo to the fifth, they intercalated a Day, as we do in our *Biſſextile* or *Leap Year*, but in ſuch Manner, that in 648 Years they included 33811 Weeks, or 236677 Days; ſo that their Year, upon an Average, conſiſted of 365 Days, 5 Hours, 48 Minutes, 53 Seconds, and this Emendation is ſaid to continue in uſe in that Empire to this Day.

Note, *If* 236677 *Days be divided by* 648, *the Quotient will give the Length of the* Year *abovementioned.*

The *Romans* uſed a greater Year than either the *Egyptians* or *Perſians*. For, according to *Julius Cæſar*'s Conſtitution, their Year conſiſted of 365 Days, 6 Hours; which 6 Hours in every fourth Year make an intercalar Day, containing 366 Days, and therefore the common Year conſiſted of but 365 Days.

By the Appointment of *Romulus*, their firſt Founder, they began their Year about the *Vernal Equinox*; but afterwards, by the Decree of *Numa Pompilius*, and the Approbation of *Julius Cæſar*, they began it from the ſhorteſt Day thereof, *viz.* the *Winter Solſtice*.

The *Venetians* began their Year from the 1ſt Day of *March*, perhaps becauſe at that Time the Foundation of their City might be laid.

There are others, who are ſaid to begin their Year from the Birth of *Chriſt*, viz. *December* 25. But the *Britons*, and moſt others, begin it the 1ſt Day of *January*; and ſo do all Aſtronomers.

Note, *In* England *we had formerly a two-fold Year*, viz. *a* Civil Year, *which began* January 1, *and an* Eccleſiaſtical Year, *which began* March 25: *but ſince the Reformation of the* Calendar *in* 1752, *they are both the ſame, and begin* January 1.

The *Muſcovites* and *Ruſſians* uſed the ſame Quantity of Time for their Year, and alſo retained the Names and Quantities of the *Roman* Months, but began their Year on the 1ſt Day of *September*.

The *Syrians*, or *Syro-Græcians*, numbered their Months and Days according to the *Julian* Manner, but gave them other Names; and began their Year after the *Autumnal Equinox*, *viz.* on the 1ſt Day of *October* of the *Julian* Year, and called it *Tiſrin prior*, as hereafter.

The *Habaſſines*, or *Abeſſines*, *Copti*, *Ethiopians*, and *Alexandrians* (all of them in *Africa*) numbered their Months and Days like the *Syrians*, but began their Year before the *Autumnal Equinox*, *viz.* the 4th of the *Calends* of *September*, anſwering

ſwering to the 29th of *Auguſt* of the *Julian* Account, or 9th Day of *September*, according to the new Account.

Note, *The* Abeſſines, *were the People of* Abeſſinia; *the* Copti, *the People of* Coptos, *a City in* Egypt; Ethiopians, *the People of* Ethiopia; *and* Alexandrians, *the People of* Alexandria, *another City in* Egypt, *built by* Alexander.

The *Julian* Year, which conſiſted of 365 Days, 6 Hours, as before mentioned, being by Obſervation found too long, it was by Pope *Gregory* the Thirteenth, in the Year of our Lord 1582, reduced to 365 Days, 5 Hours, 49 Minutes, 12 Seconds; and the Reaſon is obvious enough; for the odd 6 Hours in the *Julian* Year being not reckoned every Year, but once every fourth Year, they making this juſt 24 Hours, or a natural Day, were always put between the 23d and 24th Days of *February*, in the Biſſextile or Leap Year, by which Means the 24th Day, which in the common Year, was the Feſtival of St. *Matthias*, became in the Leap Year the 25th, and was accordingly obſerved; and the Letter F, which ſtood againſt the 24th Day, was alſo put againſt the intercalated Day, and ſo both of them having the ſame Letter, were taken and accounted for one Day. Thus it appeared that the *Julian* Year was two-fold, *viz. Common*, conſiſting of 365 Days, and *Biſſextile*, conſiſting of 366 Days. It was called *Biſſextile* from *Bis*, twice, and *Sex*, ſix, becauſe the 6th of the *Calends* of *March*, in the *Roman* Calendar, was twice repeated; *Intercalar*, becauſe of the Day that was put in between; and *Leap Year*, becauſe the fixed Holy Days did, as it were, and do ſtill, leap one Day further into the Week, than they did the Year next before.

But beſides this ſhortening of the Year, which alone was not ſufficient; the aforeſaid Pope, in the ſaid Year 1582, cauſed ten Days to be intirely taken out of the Year, from *October* the 4th, ſo that the next Day after *October* the 4th, was taken and accounted for *October* the 15th, by which Means the *Equinoctium vernum*, or *Vernal Equinox*, which before was anticipated, or brought forwarder than it ought to have been, was brought back again to the 21ſt Day of *March*, agreeable to the *Nicene* Council, eſtabliſhed *Anno Dom.* 324; and that the *Equinoctium Vernum* might invariably, for the Time to come, fall upon the ſame 21ſt Day of *March*, he appointed that the intercalated or Leap-Day, which ſhould happen in the 1ſt, 2d and 3d Hundredth Year, according to the *Julian* Account, ſhould be omitted, but in the 4th hundredth Year, the ſaid Leap-Day ſhould not be omitted, but intercalated in its proper Place.

This

This Account was, and is ſtill received in all Countries ſubject to the See of *Rome*, or in Communion with that Church; but the *Julian* Account was retained in ſeveral other Countries, particularly in *Great Britain*, till the Year 1752, when 11 Days were intirely taken out of the Calendar from the 2d Day of *September* (the next ſucceeding Day becoming the 14th Day) and the Year was fixed to 365 Days, 5 Hours, 48 Minutes, 55 Seconds. This Account, though nearly agreeing with the *Gregorian*, yet being ſomething better, was called the *New Account*.

2. The *Political* or *Civil Year*, was by ſome Nations framed by the Moon.

Thus the *Arabians*, *Indians* and *Turks*, reckon by the Moon, and make their Year to conſiſt of 12 *Synodical* Lunations, and their Period to conſiſt of 30 ſuch Years; 19 of which Years, *viz.* the 1ſt, 3d, 4th, 6th, 7th, 9th, 11th, 12th, 14th, 15th, 17th, 18th, 20th, 22d, 23d, 25th, 26th, 28th and 29th, they reckon 354 Days to the Year, and the other 11 Years they reckon 355 Days to the Year: So that by this Account their whole Period conſiſts of 10631 Days (for $354 \times 19 + 355 \times 11 = 10631$) and therefore one Lunation (there being 360, or 12 times 30 in the whole Period) contains 29 Days, 12 Hours, 44 Minutes exactly, as will appear by dividing 10631 by 360.

The ancient *Romans* alſo are ſaid to have reſpected the Moon in their Deſcription of the Year, according to the Ordination or Direction of *Numa Pompilius*.

3. The *Political* or *Civil Year*, was alſo by ſome Nations framed by the Sun and Moon together.

The ancient *Hebrews* had Reſpect to the Moon from their Departure out of *Egypt*, to the Time of the *Alexandrian* Æra; for in that Interval of Time they inſtituted the Ceremonies of the Temple, according to God's Command, by the Motion of the Moon. And although they retained ſome things of a priſtine Form, ſo that their Year was, as it were, mixed, being partly *Solar*; running back, in ſome ſort, to the *Equinoxes* and Solſtices; and partly *Lunar*, according to which their *Feriæ*, or Holy Days and Feſtivities were directed; yet by little and little they anticipated the *Equinoxes* till the Death of *Alexander* the Great, when they received the *Græcian* Year, as is plain by the Books of the *Maccabees*.

The *Attics* and *Græcians*, for the moſt Part, fitted their Deſcriptions of the Year to the Courſe of the Moon, and made a Year to conſiſt of 12 ſuch Months; yet obſerving that

that the Lunar Year did not anſwer to the Sun's Revolution, they therefore intercalated a whole Month, ſometimes in the third Year, and ſometimes alſo in the ſecond Year, according to the *Calippic* Period; whereby they both accommodated their Year to the Sun's Motion (which indeed alone defineth a Year) and kept the *Equinoxes* and *Solſtices* within their juſt Limits. However the *Attics* began their Year from the *Summer Solſtice*, or from the new Moon next it, whether before or after it.

The *Jews*, about the Time of *Conſtantine* the Great (who began his Reign *Anno Dom.* 306) framed a peculiar Calendar, by the Help of *Rabbi Hillel*, wherein they brought the Moon's Motion (which defined the Feaſts) to agree preciſely enough with that of the Sun; ſo that the *Equinoxes* and *Solſtices* could not eaſily be removed from their Places.

Thoſe, who now follow the *Roman* Calendar, do not altogether neglect the *Lunar* Year, but think likewiſe that the ſame ought diligently to be conſidered, both becauſe every one of the Months ſhould have Names given them fitted to their Qualities and Operations; and alſo that the moveable Feaſts, eſpecially *Eaſter*, the Foundation of all the reſt, might more exactly be determined.

II. Of the MONTHS.

THE *Months*, by which we meaſure the Year, are two-fold, *viz. Aſtronomical* and *Political*.

The *Aſtronomical Months*, called alſo *Natural*, are conſidered according to the Motions of the *Sun* and *Moon*; and they are either *Solar* or *Lunar*.

The *Solar Month* is that Space of Time wherein the Sun runs through a twelfth Part of the Zodiac; which one Month with another, is 30 Days, 10 Hours and a Half, very near.

The *Lunar Months* refer to the Motion of the Moon, and are three-fold, *viz. Periodical*, *Synodical*, and the Month of *Illumination*.

The *Periodical Lunar Month*, is the Space of Time, in which the Moon, by her Motion, returns to the ſame Place of the Zodiac from whence ſhe departed; which (according to her mean Motion) is performed in 27 Days, 7 Hours, 43 Minutes, 5 Seconds, nearly; but (according to her true Motion) about an Hour more or leſs.

The

The *Synodical Lunar Month*, is the Space of Time from one Conjunction of the Luminaries, till the next Conjunction following; which (according to her mean Motion) is 29 Days, 12 Hours, 44 Minutes, 3 Seconds; but (according to her true Motion) ſometimes 14 Hours, more or leſs.

The Month of *Illumination*, or *Apparition*, is the Space of Time between the firſt Day wherein the Moon is ſeen after her Conjunction, and the laſt Day of her being viſible, which is a little before her Conjunction with the Sun again; and this is ſometimes 26 Days, ſometimes 25 Days, and ſometimes leſs. For although the new Moon is ſometimes ſeen very early after her Conjunction with the Sun, ſhe is not ſeen when ſhe is ſo near to her next Conjunction, eſpecially in the Summer Seaſon, the Light of the Sun being then too powerful, unleſs it be a little after her riſing, the Sun in the mean Time being below the Horizon; though it is very eaſy to know where to look for her, *viz.* a little to the Weſtward of the Sun.

The *Political* or *Civil Months*, are ſuch as every Nation has made cuſtomary to themſelves, whereby they diſtributed the Year as beſt pleaſed them. Hence aroſe the Proportion of the Months, and their Denominations.

The *Egyptian* Months and Days are theſe.

	Days		Days
1. *Thoth*	30	7. *Phameneth*	30
2. *Phaſphi*	30	8. *Pharmuthi*	30
3. *Athyr*	30	9. *Pachſa*	30
4. *Chæac*	30	10. *Payni*	30
5. *Tybi*	30	11. *Epephi*	30
6. *Mechir*	30	12. *Meſori*	30

At the End of their laſt Month *Meſori* they added 5 Days more, thereby making their Year to conſiſt of 365 Days.

The *Hebrew* Months and Days were theſe (the firſt beginning in *Autumn*) *viz.*

	Days		Days
1. *Ethenim* or *Tiſri*	30	7. *Niſan* or *Abib*	30
2. *Marcheſuan* or *Bul*	29	8. *Jiar* or *Ziph*	29
3. *Chiſleu*	30	9. *Sivan*	30
4. *Thebeth*	29	10. *Thamuz*	29
5. *Shebeth*	30	11. *Ab*	30
6. *Adar* or *Ucadar*	29	12. *Elul*	29

And

And this was their common, ordinary, or mean Year; which conſiſted of 354 Days; and when this Year was termed *full*, or *abundant*, then 1 Day was added to the ſecond Month *Marcheſuan*, by which that Year conſiſted of 355 Days; and when one Day happened to be taken off, which was from the third Month *Chiſleu*, then it was called *common deficient*, and conſiſted of 353 Days.

The *Emboliſmical* Lunation of the *Hebrews* exceeded the common Year by 30 Days, and was inſerted next before the laſt Month, and was called *Adar*, like the 6th Month, and then the laſt was called *Veadar*, which otherwiſe was called *Elul*. And as by the Addition or Intercalation of the ſaid 30 Days, there might ſometimes be a Redundancy, and ſometimes a Defect of 1 Day, ſo 1 Day was either taken off or added, as above-mentioned.

The *Perſian* Months and Days were theſe, *viz.*

	Days		Days
1. *Pharawardin* - -	30	7. *Mehar* - - - -	30
2. *Adarpahaſeht* - -	30	8. *Aban* - - - -	30
3. *Chardad* - - - -	30	9. *Adar* - - - -	30
4. *Thir* - - - - -	30	10. *Di* - - - - -	30
5. *Mardad* - - - -	30	11. *Behemen* - - -	30
6. *Scheberiz* - - - -	30	12. *Aſphander* - - -	30

To which were added, in the common Year, 5 intercalar Days, and 6 in the intercalar or Leap Year, which they called *Muſterka*.

The *Romans* (according to the Ordination or Direction of *Romulus*, who was the Founder of their City, as before-mentioned, and conſequently their firſt King) had at firſt but 10 Months in the Year, wherein they included 304 Days.

The firſt of which was *Martius*, our *March*, which *Romulus* ſo named from *Mars* the God of War, becauſe he would have the *Roman* Nation Martial or Warlike.

The ſecond was *Aprilis* our *April*, from *Aperio*, to open; becauſe then the Pores of the Earth were opened, and the Trees and Herbs began to ſpring out.

The third was *Maius*, our *May*, from *Major* greater; or from *Majus Deus*, *i. e. Jupiter*; or from *Madefacio*, to wet or moiſten; becauſe of the wet Weather then and there happening, which was thought to be occaſioned by the riſing of the *Pleiades* or *Hyades*, *i. e.* the ſeven Stars in *Taurus*, or the *Bull's* Neck.

The

The fourth was *Junius*, our *June*, from *Junior*, younger; or from *Juno*, the Wife of *Jupiter*, who, not unlikely, was younger than *Jupiter*; for though they were firſt of all, Brother and Siſter, and born at the ſame Birth, it does not appear that *Juno* was the firſt born; conſequently if *Jupiter* was firſt born, *Juno* muſt be *Junior* or younger.

The fifth was *Quintilis*, as being the fifth Month from *March* incluſive; now our *July*.

The ſixth was *Sextilis*, as being the ſixth Month from *March* incluſive, now our *Auguſt*.

The ſeventh was *September*, from *Septem*, ſeven (the ſame with our *September*) becauſe it was the ſeventh Month from *March* incluſive.

The eighth was *October*, from *Octo*, eight (the ſame with our *October*) becauſe it was the eighth Month from *March* incluſive.

The ninth was *November*, from *Novem*, nine (the ſame with our *November*) becauſe it was the ninth Month from *March* incluſive.

The tenth was *December*, from *Decem*, ten (the ſame with our *December*) becauſe it was the tenth Month from *March* incluſive.

Four of theſe Months, *viz. Martius*, *Maius*, *Quintilis* and *October*, *i. e. March*, *May*, *July* and *October*, were called *Pleni*, full, becauſe each Month contained 31 Days, that is, they were the longeſt Months; and the other ſix, *viz. Aprilis*, *Junius*, *Sextilis*, *September*, *November* and *December*, *i. e. April*, *June*, *Auguſt*, *&c.* were called *cavi*, hollow, becauſe each Month wanted a Day of being equal with the four longer Months.

This *Calendar* is ſaid by ſome, to have continued no longer than *Romulus* reigned, *viz.* 45 *Romuleian* Years, and about 200 Days, making about 38 of our Years; but others ſay, it laſted only 24 *Romuleian* Years, making 20 of our Years.

But however this was, it is ſaid that *Numa Pompilius*, the ſecond King of the *Romans*, perceiving his Predeceſſor's Year to be too ſhort, he added 51 Days, which together with 6 other Days that he took from the 6 *Caval Months*, of 30 Days each, he diſpoſed into two new Months, calling them *Januarius*, *January*, and *Februarius*, *February*: To *January* he aſſigned 29 Days, and to *February* 28, and placed them before *Martius* or *March*.

Januarius

Januarius was ſo called, either from from *Janua*, a Gate, becauſe an Entrance was thereby made into the Year, as through a Gate into the Hall; or from double-faced *Janus*, looking back upon the End of the paſt Year and the Beginning of the following, or next ſucceeding Year; of whom take the following Relation, *viz.*

Janus was the moſt ancient King of *Italy*, among the *Aborigines*, a Set of People, that *Saturn*, the Father of *Jupiter*, brought into that Country, where they ſettled in the Mountains. When *Jupiter* had made War againſt his Father, and baniſhed him from *Crete*, *Janus* received him, and gave him Part of his Kingdom. Here *Saturn* taught *Janus* Huſbandry, and the Method of coining Mony of Braſs, which on one Side had the Repreſentation of a *Ship*, and on the other Side that of *Janus*. It was reported of him, that he was the wiſeſt of all Kings, and knew Things not only paſt, but thoſe which were to come, therefore the Ancients pictured him with two Faces. After his Deceaſe, his People deified him, *i. e.* made a god of him, and *Numa* built a Temple in Honour of him, which, in the Time of Peace, was always kept ſhut, but in the Time of War was always kept open.

Janus was thought by ſome to be the ſame with *Noah*, whence he might be ſaid to have two Faces, one looking backward upon the old World, which was before the Flood; the other forward upon the new World, which was after the Flood; and for this Reaſon, perhaps, the Ship on his Coin was in Memory of the Ark. He is ſaid to have come into *Italy* in the golden Age of the World, not upon the Account of Gold itſelf (for perhaps there was none at that Time) but becauſe Men were juſt, free from Avarice and Covetouſneſs; and as he had learnt Huſbandry from *Saturn*; ſo he taught the ſame to his People, and withal to live temperately, and offer Sacrifices.

Februarius, was ſo called from *Februo*, to ſacrifice; becauſe in this Month the *Romans* ſacrificed to *Pluto* (who was alſo called *Februus*) and the other infernal gods, for the Souls of their Anceſtors.

And thus were all the Months of the *Numan* Year ordained, and ſo the Year itſelf, to conſiſt of an odd or unequal Number of Days, in Honour of an unequal Number accounted of as ſacred by the *Pythagoreans*, excepting only *February*, which had an even or equal Number of Days allowed it, leſt if all of them had run either by an equal or unequal Number of Days, they ſhould have made a like Conſum-

Conſummation or Ending: And hence aroſe this Diſpoſition of the Months, *viz.*

	Days		Days
1. *Januarius* — — —	29	7. *Quintilis* — — —	31
2. *Februarius* — — —	28	8. *Sextilis* — — — —	29
3. *Martius* — — — —	31	9. *September* — — —	29
4. *Aprilis* — — — —	29	10. *October* — — —	31
5. *Maius* — — — —	31	11. *November* — — —	29
6. *Junius* — — — —	29	12. *December* — — —	29

Wherein, although *Januarius* and *Februarius*, were put before *Martius*, and ſo *Martius* was made the third Month inſtead of the firſt; yet *Quintilis* (now no longer the fifth, but the ſeventh Month) retained ſtill the ſame Name, as did alſo the other following Months in their Order.

But when *Numa* obſerved, that by this Quantity of the Year (which was only *Lunar*, and conformable to the *Græcian* Year) the Sun returned not to the ſame Point in the Heavens; he reduced and accommodated this *Lunar Year* to the Sun's Motion, by the Intercalation of a new Month, conſiſting of 22 Days, or 23 Days, which afterwards the *Romans* called *Februarius intercalaris*, or *Mercedonius menſis*, which every other Year was intercalated, leſt *March* ſhould be removed from the Beginning of the Spring, or that more Years ſhould be accounted from the Building of *Rome*, than juſtly the true Quantity of the Year would allow of.

Note, *It was called* Mercedonius Menſis, *becauſe (beſides its being appointed for the rectifying of the Year) it was uſed as a Time for Payments of Rents, Wages, &c. Hence aroſe the* Mercedonicæ Dies, *or Pay-Days, inſtead of that Month, appointed by* Julius Cæſar, *which were* 6 *in* July, 4 *in* September, *and* 3 *in* November; *which Days were all marked in the old* Roman *Calendar with* MERK *on the Side.*

But although this kind of *Intercalation*, ſo reſtored the *Numan* Year (which without it was merely Lunar) to the Sun's Courſe, that the *Equinoxes* and *Solſtices* were in a manner fixed to the ſame Months: Yet afterward, when they obſerved it exceeded the true and natural Quantity of the Year, and that the Arch Prieſt (whoſe Buſineſs it was to correct the *Intercalation*) had oftentimes omitted it, and either out of Malice or Favour (whereby any Man might be got rid of, or longer continued in his Maſterſhip, whatever it was; or the Renter of the Tribute or Cuſtoms, or other public Things, either gain or loſe by the Increaſe or Decreaſe of the Year) had ſeveral Ways depraved it, it fell out that *Anno Urbis conditæ*

708, *i. e.* in the 708th Year of the Building of *Rome*, after the *Numan* Year had been in Uſe 670 Years, the Correction made by *Julius Cæſar* was received.

For *Julius Cæſar*, who was the firſt Monarch or Emperor of the *Romans*, having learned Mathematics at *Alexandria* obſerved that there were 10 Days and almoſt 6 Hours wanting in the *Numan* Year, to the full compleating of the Solar Year; and by the Advice of *Soſigenes* the Mathematician, whom after his Overthrow of *Pompey*, he brought with him out of *Egypt* to *Rome*, he added thoſe 10 Days, whereof to *Januarius*, *Sextilis* and *December*, 2 Days each; but to *Aprilis*, *Junius*, *September* and *November*, but 1 Day each.

And now becauſe *Quintilis* was a wrong Name for that Month, that being now the 7th Month from the Beginning of the Year incluſive, which at its firſt Inſtitution was but the 5th, and *Julius Cæſar* having been born in that Month, it was thought proper, in Honour of him, to reject that Name, and give it the Name of *Julius*, the ſame with our *July*.

For a ſimilar Reaſon was *Sextilis* rejected in the following Reign, or ſoon after: For *Auguſtus Cæſar*, who was Nephew to *Julius Cæſar*, ſucceeding his Uncle in the Empire, either called this Month by his own Name, or the Senate did it in Honour of him, he dying in this Month. Thus it was that the civil *Roman* Months were numbered and nominated with the ſame Number of Days, juſt as we have them at this preſent Time, *viz.*

	Days		Days
1. *Januarius*	31	7. *Julius*	31
2. *Februarius*	28	8. *Auguſtus*	31
3. *Martius*	31	9. *September*	30
4. *Aprilis*	30	10. *October*	31
5. *Maius*	31	11. *November*	30
6. *Junius*	30	12. *December*	31

And although the Year hath ſince been corrected by *Gregory* the 13th Biſhop of *Rome*, yet do the Order of the Months, and the Number of Days in each Month, continue the ſame in the corrected, that they did in the old *Julian* Year: they differing only in this, that in the Space of 400 Years, the *Julian* Account exceeds the *Gregorian*, by 3 Intercalations, or Days, which in the laſt Emendation of our Calendar, is directed to be cut off in every hundredth Year, not diviſible by 4 without a Remainder.

The

The *Syrian*, or *Syro-Chaldæan* Year, as uſed by that People anciently, and ſome ſay at this preſent Time, agrees with the *Julian* Year in Number of Months, Days in each Month, and manner of Intercalation; but has a different Beginning. For the firſt Month of the *Syrians* Year anſwers exactly to the *Romans October*, and conſequently the 1ſt Day of that Month was the 1ſt Day of their Year, *viz.*

	Days		Days
1. *Tiſrin prior (Oct.)* –	31	7. *Niſan (Apr.)* – –	30
2. *Tiſrin poſterior (Nov.)*	30	8. *Jiar (Maius)* – –	31
3. *Canun prior (Dec.)* –	31	9. *Huzaran (Junius)* –	30
4. *Canun poſterior (Jan.)*	31	10. *Tamuz (Julius)* –	31
5. *Sabat*, common *(Feb.)*	28	11. *Ab (Aug.)* – – –	31
biſſextile	29	12. *Elul (Sept.)* – –	30
6. *Adar (Mar.)* – –	31		

The *Syro-Græcian* Year was the ſame with the *Syrian* as above, both in Number of Months and Days in each Month, and alſo the Beginning of their Year, *viz.*

	Days		Days
1. *Hyperberetæus (Oct.)* –	31	7. *Xanthicus (Apr)* –	30
2. *Diuo (Nov.)* – – –	30	8. *Artemiſius (Mai.)* –	31
3. *Appellæus (Dec.)* – –	31	9. *Dæſius (Jun.)* – –	30
4. *Audinæus (Jan.)* –	31	10. *Panemus (July)* –	31
5. *Peritius* common *(Feb.)*	28	11. *Lous (Aug.)* – –	31
biſſextile	29	12. *Gorpiæus (Sep.)* –	30
6. *Dyſtrus (Mar.)* – –	31		

The *Abyſſines* and *Copti*, a People of the inner Part of *Africa*, began their Year on the 29th Day of the *Julian Auguſt*, whoſe Months and Days were as follows, *viz.*

	Days		Days
1. *Tuth* – – – –	30	7. *Pharmahath* – –	30
2. *Papa* – – – –	30	8. *Parmuda* – – –	30
3. *Hathur* – – –	30	9. *Paſchnes* – – –	30
4. *Chiac* – – – –	30	10. *Peuna* – – – –	30
5. *Tuba* – – – –	30	11. *Epip* – – – –	30
6. *Amſchir* – – – –	30	12. *Muſre* – – – –	30

Unto which they added 5 Days in the common and 6 in the Biſſextile Year.

From

From the ſame 29th of *Auguſt* did the *Ethiopians* reckon their Year, the Names of whoſe Months were as follows, *viz.*

1. *Maſcaram*	5. *Thir*	9. *Ginboth*
2. *Tikmith*	6. *Jacatith*	10. *Sene*
3. *Hadar*	7. *Magabith*	11. *Hamle*
4. *Tackchas*	8. *Miazia*	12. *Nahaſe*

And, as far as we know, they had the ſame Number of Days, *viz.* 30 in each Month; adding likewiſe 5 Days at the End of the common Year, and 6 in the Biſſextile.

The *Arabians* and *Turks* began their Year from the Æra of *Mahomet*, whoſe Months and Days are as follow, *viz.*

	Days		Days
1. *Muhartam* - -	30	7. *Regeb* - - - -	30
2. *Spehar* - - -	29	8. *Sahaben* - - -	29
3. *Rabie prior* - -	30	9. *Ramadhan* - - -	30
4. *Rabie poſterior* -	29	10. *Schewal* - - -	29
5. *Giumadi prior* -	30	11. *Dhilkahda* - - -	30
6. *Giumadi poſterior* -	29	12. *Dhilhaga* or *Dhilkitſche*	29 in the common Year, and 30 in the Intercalar.

Thus their Year conſiſts of but 354, and ſometimes 355 Days, and therefore the firſt Day of their Year muſt wander through all the Seaſons, but in a retrograde Manner, becauſe it is ſhorter than the true Solar Year.

Note, *In* England, *and no where elſe that I know of, we commonly reckon* 4 Weeks *to a* Month; *by which* Month *Sailors are commonly paid their Wages.* 13 ſuch Months, and 1 Day make a common Year.

III. Of the WEEKS.

THE *Hebdomada*, or *Week*, in Chronology, is a Diviſion of Time, conſiſting of ſeven Days.

The Origin or Beginning of this Diviſion of *Weeks*, or of computing Time by Sevenths, has been controverted: Some having ſuppoſed it to take its Riſe from the four Quarters of the Moon, that is, New, firſt Quarter, Full, and laſt Quarter, (ſhe having at thoſe Times different Appearances) which being about 7 Days diſtant, gave Occaſion to ſuch a Diviſion.

But however this was, the manner of dividing Time into *Weeks*, according to the preſent Manner, as obſerved by all *Europe*,

Europe, at leaſt, and not unlikely in ſeveral Parts of *Aſia*, *Africa* and *America*, is very ancient. The *Egyptians*, *Syrians*, and moſt of the Oriental Nations, appear to have uſed it from all Antiquity; though it did not get Footing in the Weſtern Part of the World till Chriſtianity brought it thither.

The ancient *Romans* are ſaid to have reckoned their Days, not by *Sevenths*, but by *Ninths*, and the ancient *Greeks* by *Decads* or *Tenths*.

The *Hebrews* of old, divided their Time by *Weeks* or *Sevenths*, but it was upon a different Principle from the other Eaſtern Nations; God himſelf having appointed them to work ſix Days, and to reſt the *Seventh*, as fully appears by the fourth Commandment. *Six Days ſhalt thou Labour, and do all thy Work, but the ſeventh Day is the Sabbath of the Lord thy God*, Exod. xx. 9, 10. And this was after God Almighty's own Pattern or Example, who at the Creation of the World, is ſaid to have *worked ſix Days, but on the ſeventh Day reſted from all his Work, and bleſſed it, and ſanctified it*, Gen. ii. 3.

Among the Heathens of the Eaſt, it is, with very good Reaſon, ſuppoſed to be a Remain of the Tradition of the Creation, which they had ſtill retained, with divers other Traditions.

The Days of the Week were denominated by the *Jews* from the Order of their Succeſſion from the Sabbath. Thus the Day next after the Sabbath, they called the firſt of the Sabbath; the next the ſecond of the Sabbath; and ſo of the reſt, except the ſixth, which they called *Paraſceve*, or Preparation of the Sabbath, becauſe they prepared and ſet all things in order on the *Friday*, that ſo nothing might be done on the Sabbath, but the Works of abſolute Neceſſity; and the Sabbath was the laſt Day of the Week. The like Method is ſaid to be ſtill kept up by the *Perſians*, *Ethiopians*, and the Chriſtian *Arabs*.

The ancient Heathens denominated the Days of the *Week* from the ſeven Planets, which Names are ſtill generally retained, not only in *England*, but in *France*, *Spain*, *Portugal*, *Italy*, *Germany*, *Holland*, *Denmark* and *Sweeden*. Thus the firſt Day of the Week is commonly called *Sunday* (*dies Solis*, Sun's Day) and is derived from the *Sun*, that glorious Luminary of Heaven, which was worſhiped by our idolatrous Anceſtors on that Day.

The ſecond Day is called *Monday* (*dies Lunæ*, Moon's Day) and is derived from the Moon; that Planet being anciently

ciently worſhiped by ſome of the Heathens on that Day. Hence the French *Lundi*, from *Luna* the Moon.

The third Day is called *Tueſday* (*Tuiſco*'s Day) and is derived from *Tuiſco*, a *Saxon* Deity, which was worſhiped on that Day, and is ſuppoſed to be the ſame with *Mars* the God of War. Hence *dies Martis*, and the French *Mardi*, or *Mars*'s Day.

The fourth Day is called *Wedneſday* (*Woden*'s Day) and takes its Name from *Woden*, an Idol worſhiped by the ancient *Saxons* on this Day. He is ſuppoſed to be the ſame with *Mercury*. Hence *dies Mercurij*, and the French *Mecredi*, *Mercury*'s Day.

The fifth Day is called *Thurſday* (*Thor*'s Day) and is derived from an ancient *Saxon* Idol called *Thor*, which uſed to be worſhiped on that Day. It is ſuppoſed to be the ſame with *Jupiter*, hence called *dies Jovis*, or *Jove*'s Day: hence alſo the French *Jeudi*, *Jupiter*'s Day.

The ſixth Day is called *Friday* (*Friga*'s Day) derived from *Friga*, an Heathen Goddeſs, who was worſhiped by our Forefathers on that Day; and is ſuppoſed to be the ſame with *Venus*; hence the Latins call it *dies Veneris*, *Venus*'s Day; and the French *Vendredi*, ſignifying the ſame.

The ſeventh, and laſt Day of the Week is called *Saturday* (*Saturn*'s Day) from *Saturn*, an old Heathen Deity, or Idol, which was worſhiped on that Day: The *Latins* called it *dies Saturni*, and the French *Samedi*, both ſignifying the ſame Day.

Under the *Moſaic* Diſpenſation, the ſeventh or laſt Day of the *Week* (which is our *Saturday*) was kept holy by an expreſs Command from God, in Memory of the *Creation* of the World, as was before obſerved; but with the *Chriſtians*, the firſt Day of the Week is kept holy, in Memory of our Saviour's *Reſurrection* from the Dead: And this was begun to be transferred from one Day to the other, by the Apoſtles, but was not abſolutely fixed till ſome Time after all the Apoſtles had ſuffered Martyrdom; the *Jewiſh* Converts, eſpecially, in the mean While, retaining an Affection for their old Sabbath, inſomuch that for a long Time both Days were religiouſly obſerved; till ſuch Time as Kings themſelves embraced the Chriſtian Religion, and as ſuch became the nurſing Fathers to the Church of *Chriſt*, and Chriſtianity became national, and then it was fixed to the firſt Day of the Week, by *Conſtantinus magnus*, *Conſtantine* the Great, who was the firſt Emperor that embraced the Chriſtian Faith.

IV. Of

IV. Of the DAYS.

THE ancient *Romans* divided each of their Months into *Calends*, *Nones* and *Ides*.

The *Calends* were the firſt Day of every Month, derived from *Calo*, an old Word in the *Roman* Language (the ſame with *Voco*, ſignifying to call) the Gerunds of that Word being *calendi* of calling, *calendo* in calling, and *calandum* to call; hence the Word *Calends*, becauſe the People were then called or obliged to pay their Uſe-Mony; whence alſo thoſe Days were called *Triſtes Calendæ*, *i. e.* ſad Calends or Days, becauſe ſome People being either unable or unwilling to pay their borrowed Mony, with the Intereſt, were puniſhed according to the Laws then in Force. They were alſo called *celeres Calendæ*, ſwift Calends, becauſe of their quick Return; unthinking People not regarding the Day till it came upon them, as it were, at once; and then they would complain, that thoſe Days came about very quick; juſt, as many People do at this Time, who being indifferent about paying their Rents, ſay *The Quarters come about very faſt.*

The *Nones* derived from the *Latin* Word *Nonus*, the ninth, becauſe they were always the ninth Day before the *Ides*; and in *March*, *May*, *July* and *October*, happened upon the ſeventh Day, but in the reſt of the Months on the fifth Day.

The *Ides* derived from the *Latin* Word *Idus*, and that from *Iduo*, which in the *Hetruſcan* Tongue, or Language of *Tuſcany*, is *Divido*, from an obſolete Word *Dividuo*, which ſignifies, I divide; hence by an Ellipſis *Iduo*, as before, ſignifying the ſame, becauſe the *Ides* divided every Month almoſt in the Midſt: The Months *March*, *May*, *July* and *October*, having the *Ides* on the 15th Day of each Month, and all the reſt on the 13th Day; the other intervening Days were reckoned as ſo many Days, *viz.* 5th, 4th, 3d, *&c.* before the *Calends*, *Nones* or *Ides*.

Days are of two Kinds, *natural* and *artificial*.

The * *natural Day* contains the Time that is taken up in one intire Revolution of the Earth upon its own Axis, at the ſame Time that it moves round the Sun; and this makes the two Quantities of Light and Darkneſs, which immediately ſucceed each other, commonly called Day and Night, and is divided into twice 12, or 24 equal Parts, called Hours.

* Note, *Some Writers call this a* Civil Day; *and that only a* Natural Day, *which is between Sun-riſe and Sun-ſet*,

The

The *artificial Day* is all that Space of Time between Sun-riſing and Sun-ſetting, which is always increaſing or diminiſhing, according to the Latitude, and according to the Sun's Place in the Ecliptic; or, which is the ſame thing, according to his Declination, whether North or South. The *artificial Night* is all that Space of Time between Sun-ſetting and Sun-riſing; and this, like the *artificial Day*, is always increaſing or decreaſing, but with this Difference, that when the Day increaſes, the Night diminiſhes; and when the Night increaſes the Day diminiſhes.

The *Chaldeans* and ancient *Hebrews* began their *natural Day* at the Riſing of the Sun, and ended it again at his next Riſing.

The *Romans* began it at Midnight, and ended it the Midnight next following. — The ſame is done by ſeveral Countries at this preſent Time, *viz. Great Britain, Ireland, France, Spain, Portugal, Holland, Denmark* and *Sweden*.

The *Egyptians* began their Day at Noon, and ended it the Noon next following: And, according to this Account, do all Aſtronomers now frame their Computations; every one according to the Meridian of the Place where he lives, or where he makes his Calculations for.

The *Babylonians* began their *artificial Day* at Sun-riſing, and ended it at Sun-ſetting; and their *artificial Night* at Sun-ſetting, and ended it at Sun-riſing.

The old *Italians* began their *natural Day* at Sun-ſetting, and ended it at Sun-ſetting the next Day.

The *Jews*, at and before our Saviour's Time, began their *artificial Day* at the Time of Sun-riſing, and ended it at Sun-ſetting; and their Night began at Sun-ſetting, and ended at Sun-riſing, like the ancient *Babylonians*. But in the Diviſion of their Hours, they differed from all others; for they divided the Time between Sun-riſing and Sun-ſetting, into 12 equal Parts, and the Night, from Sun-ſetting to Sun-riſing, they divided into 12 other equal Parts; ſo that the Hours of their Day and their Night were never equal one to the other, nor to thoſe of other Countries; but when the Sun was in the *Equinoctial*, which now happens about the 20th or 21ſt of *March*, and the 22d or 23d of *September*: For all the Inhabitants on the North Side of the Equator, when the Sun is in North Latitude, have their Days longer than their Nights, from the 20th or 21ſt of *March*, to the 22d or 23d of *September*; and all on the South Side of the Equator, when the Sun is in South Latitude, have their Days longer than their Nights,

from the 22d or 23d of *September* to the 20th or 21ſt of *March*, notwithſtanding the whole natural Day is divided into 24 equal Parts or Hours: But the *Jewiſh* Account of Hours differed from all thoſe; for on the North Side of the Equator, from *March* to *September* as aforeſaid, the Hours of their Day were longer than the Hours of their Night: And all the Time between *September* and *March* as aforeſaid, the Hours of their Night were longer than thoſe of their Day; the contrary in South Latitude: So that when our *artificial Day* was 15 Hours between Sun-riſing and Sun-ſetting, then did the *Jewiſh* Day-hour contain one Hour and a Quarter of our Hour in Length, and their Night-hour but three Quarters of our Hour: Alſo when our *artificial Day* was but 9 Hours long, then was their Day-hour but 45 of our Minutes, or three Quarters of an Hour long, and their Night-hour equal in Length to 1 Hour and 15 Minutes of our Time. And ſo they varied all the Year, and were never equal with our Hours, or the reſt of the World, except when the Sun, as aforeſaid, was in the *Equinoctial*. Now, admitting our *Meridian* and theirs to have been the ſame, our 12 at Noon was then the ſame with their 6th Hour of the Day, and our 12 at Night the ſame with their 6th Hour of the Night; that is, our Noon would be the ſame with their Noon, and our Midnight the ſame with their Midnight: But in Fact it was not ſo; for the Difference between our *Meridian* and theirs is almoſt 45 Degrees, making 3 Hours of Time nearly, as appears very evidently by the Terreſtrial Globe; and their Meridian being alſo to the Eaſtward of ours, made their 6th Hour, or Noon-Day, 3 Hours, or very near ſo, ſooner than ours. Hence their Noon-Day was at our 9 in the Morning, or very near ſo; and hence alſo appears very plainly, what thoſe 3d, 6th and 9th Hours were, at our Saviour's Paſſion, as mentioned *Mark* xv. 25th, 33d and 34th Verſes; where at Verſe the 25th, it is ſaid, *That they crucified him at the third Hour*, which Hour, had our Meridians been the ſame, would have been about our 9 in the Morning, but as their Noon was very near 3 Hours before ours, ſo the Time of our Saviour's Crucifixion was, according to our Computation of Time, about 6 in the Morning; for the Crucifixion happening about the Time of the Vernal Equinox, reduced their Hours to an Equality with ours, or very nearly ſo — At Verſe the 33d, it is ſaid, *There was Darkneſs over the whole Land, from the 6th to the 9th Hour i. e.* from their Mid-day to the End of 3 Hours after; and at Verſe 34th,

it

it is ſaid, *That at the 9th Hour our Saviour cried with a loud Voice*, uttering that moſt lamentable Expreſſion, *Eloi, Eloi, lama ſabachthani*; or, *My God, my God, why haſt thou forſaken me:* By which it appears, that he hung upon the Croſs full ſix Hours before he expired, *viz.* from the 3d to the 9th Hour, *i. e.* from our 6 in the Morning to 12 at Noon, Regard being had to the Difference of Meridians, as was obſerved before. By this Means alſo will appear, what that 3d Hour of the Night was, when the chief Captain ordered St. *Paul* to be conveyed from *Jeruſalem* to *Ceſarea*, *Acts* xxiii. 23. For as the third Hour before mentioned at the Crucifixion of our Saviour was three Hours before their Noon, ſo by Parity of Reaſon, their 3d Hour of the Night was three Hours before their Midnight, *i. e.* Nine o'Clock with them, if Clocks had been then in uſe, as we have them now; equal to, or very near our Six in the Afternoon.

V. Of the HOURS.

AT this preſent Time in *Europe*, and ſome other Parts of the World, the natural Day, whether it be taken from Noon to Noon, or from Midnight to Midnight, is divided into 24 equal Parts, called Hours, and theſe are ſubdivided into twice 12 Hours; one 12th Hour ſerves for Noon or Mid-day, the other 12th Hour for Midnight: And as all our Clocks and Watches have their Dial-Plates divided only into 12 equal Parts or Hours, ſo their *Indices* or *Hands* go twice round: Hence all the Hours from Midnight to Noon are called *Ante Meridiem*, before Noon, or Morning Hours; and all the Hours from Noon to Midnight are called *Poſt Meridiem*, or Afternoon; otherwiſe more commonly diſtinguiſhed after this manner, *viz.* From Noon to Sunſet, the Hours are called Afternoon; from Sunſet during the Time of Twilight, 'tis called Evening; after Twilight it grows dark, and then it is called Night, even though the Moon ſhould ſhine and be at the full.

The modern *Italians* differ from the reſt of the *Europeans*; for they not only divide the natural Day into 24 equal Parts or Hours, but the Dial-Plates of their Clocks and Watches are divided ſo too; and whereas our Indices or Hands make two Rotations in that Space of Time, theirs make but one, and go regularly on from 1 to 24, ſo that 12 o'Clock is their Mid-day, and 24 o'Clock their Midnight.

But however it is now, that $\frac{1}{24}$ Part of a Day natural, makes what we now call an Hour, it was not ſo from the Beginning. For, as for the Method of computing the Time of the Day by the *Antediluvians*, or People before the Flood; we have no Footſteps of it remaining; and for a long Time after the Flood, it does not appear by any Hiſtory, ſacred or prophane, that the People divided their Time as we do now, or knew any thing of an Hour, as we now underſtand it.

In the Time of *Ahaz*, King of *Judah*, 2 *Kings* xx. 11, there was a Sun-dial, whether placed horizontally in his Garden, or erect on the Side of his Houſe, or whether it was on a convex or concave Superficies, or *in Plano*, is not eaſy to determine; and the Time that then paſſed was ſaid to be by Degrees, of which we are equally as ignorant: however, it is certain there were ſome diſtinguiſhing Lines upon it, whereby the Increaſe of the Day before Noon, and Decreaſe of it after Noon, might be known.

In the *Old Teſtament*, the Word Hour occurs only in the Prophet *Daniel*, and no where elſe; and there five times, *viz. Daniel* iii. 6, 15; iv. 19, 33, and v. 5, in four of them the Expreſſion is *ſame Hour*, ſignifying almoſt the ſame Point of Time; but in chap. iv. *v.* 19, it is ſaid *one Hour*, *i. e.* at the Relation of King *Nebuchadnezzar*'s Dream, told by *Nebuchadnezzar* himſelf, *Daniel was aſtonied*, *i. e.* aſtoniſhed (ſome Bibles having it one way, ſome another) *one Hour*: The Meaning of which is, that he was in ſuch Confuſion within himſelf, that he was not able to expreſs himſelf during that Time.

At the ſame Time the Prophet *Daniel* was in *Babylon*, captivated with the reſt of his Brethren the *Jews*; and as the *Babylonians* began their artificial Day at Sun-riſing, and ended it at Sun-ſetting, as has been ſaid before: So by the Expreſſion *one Hour*, we muſt imagin that the *Babylonians* divided their Day into other Portions of Time, than what was on the Dial of *Ahaz*, the better to diſtinguiſh how the Time paſſed away; and not unlikely, but they might divide their artificial Day into 12 equal Parts, whatever their Names were, though thoſe Parts, like the Day, might be daily increaſing, or decreaſing; and that the *Jews* received this Diviſion of the Day from them; and then we may gueſs what the Quantity of that Time was, which is there called *one Hour*, and judge it to be not greatly differing from our own Hour, whether more or leſs, as was mentioned of the *Jewiſh* Diviſion of the Day, a little before.

VI. Of

VI. Of MINUTES.

THE Diviſion of the Day into equal Parts, of what ſort ſoever they were when firſt invented, and ſince improved into what we call Hours, was certainly of much earlier Date than *Minutes*, inaſmuch as the Minute (the mechanical Minute, if I may ſo call it, I mean) or 60th Part of an Hour, mechanically exhibited, was not known to the Ancients; nor immediately after the Hour was ſettled, as we now uſe it, though the Aſtronomical Minute was known long before, and therefore, very likely, it was ſome *Horologiorum fabricator*, i. e. *Clockmaker*, who firſt introduced the Minute, by dividing the Hour into 60 equal Parts, as we ſee them on the Dial-plates of Clocks and Watches, that ſuch Piece of Clock-work might appear to be the more ingenious; and likewiſe ſhew to the Admirers, how eaſily, pleaſantly, and almoſt inſenſibly the Hour paſſed away, by thoſe ſmall Portions of Time.

Note, *A* Minute *is ſometimes called a* Moment, *d rived from the* French *Word* Moment, *and that from the Latin* Momentum, *which ſignified the ſmalleſt Portion of* Time *that could be aſſigned, before* Seconds *were uſed.*

VII. Of SECONDS.

QUICK as the Minutes flee away, we find that they were capable of the ſame mechanical Diviſions, that is, each one into 60 equal Parts, called *Seconds*, and be exhibited to Sight, as were the Minutes before mentioned. They are derived from Aſtronomical *Seconds*, as being the 60th Parts of a Prime or Minute in Aſtronomy, and thence became applicable to the 60th Part of a Minute of Time. This, no Doubt, was another Contrivance of ſome ingenious Clock-maker, to ſet three *Indices*, or *Hands*, as we commonly call them, a going at once, to point out the Time of the Day or Night, in the moſt minute and circumſtantial Manner.

There are Clocks with ſhort Pendulums which beat Half Seconds, and Watches that beat Quarter Seconds, but what Service ſuch Beats would be of, if mechanically exhibited, ſeems, at preſent, not very eaſy to determin.

TABLES OF SCRIPTURE-MEASURES, WEIGHTS and COINS:

WITH AN APPENDIX,

Containing the Method of calculating its MEASURES of SURFACE.

A Meaſure is a known Quantity applied to another of the ſame Kind that is leſs known, to make its Dimenſions better known, by Help of Numbers, expreſſing the Proportion that the known Quantity bears to the unknown.

The Dimenſions to be meaſured are three.

Firſt, Meer Length, which hath but one Dimenſion.

Secondly, Surface, which conſiſts of Length multiplied into Breadth; ſo it hath two Dimenſions, as it were interwoven, and this is always meaſured by ſome ſquare Surface, already known, as by a ſquare Foot, or a ſquare Cubit, or any other Square already known, by the Help of its Side. *Moſes* generally uſed the ſquare Cubit.

Thirdly, Solidity or Capacity, which hath three Dimenſions multiplied into each other, *viz.* Length, Breadth and Heighth or Depth. This is meaſured by a known Cube.

From Solidity ariſeth Weight in all ſublunary Bodies; and by Weight we meaſure the Value of Coins: Therefore I ſhall join Weights and Coins togother in the fourth *Table*.

TABLE I.

Of Measures of Length.

The Cubit and its Parts are expreſſed both by Inch-Meaſure, and by Foot-Meaſure, which is deduced from Inches by this Proportion,

I. *F.* *I.* *F.*
12 : 1 : : 21.888 : 1.824

		In. Meaſ.	F. Meaſ.
A *Cubit* is		= 21.888	= 1.824
A *Span*, the longer	= $\frac{1}{2}$ of a Cubit	= 10.944	= .912
A *Span*, the leſs	= $\frac{1}{3}$ of a Cubit	= 7.296	= .608
A *Hand's Breadth*	= $\frac{1}{6}$ of a Cubit	= 3.684	= .304
A *Finger's Breadth*	= $\frac{1}{24}$ of a Cubit	= .912	= .076

Note, *Meaſures of many Cubits Length are expreſs'd only in Foot-Meaſure.*

	Cubits.	
A *Fathom* is	= 4	= 7.296
Ezekiel's Reed	= 6	= 10.944
A *Schænus*, the *Egyptian* Line for Land Meaſure, which I think Scripture uſeth to divide Inheritances, *Pſalm* xvi. 6, and lxxviii. 55. They uſed different Lengths, but the ſhorteſt, and moſt uſeful was	= 80	= 145.92

Herodotus mentions a *Schænus* juſt 300 times as long: I judge that all the greater were made in Proportion to the leaſt.

The *Mile* is	= 4000	= 7296.
The *Stadium* = $\frac{1}{10}$ of their Mile	= 400	= 729.6
The *Paraſang* = 3 of their Miles	= 12000	= 4 *Engliſh* Miles, and 580 Feet.

TABLE II.

Of Measures of Surface.

MOSES hath deſcribed theſe by ſqua Cubits. I here expreſs them reduced to our ſquare Feet: The Method of this Reduction is taught in the following *Appendix*; but here I ſhall

Firſt, Propoſe three clear Examples given by *Moſes*.
Secondly, Place ſix Inſtances of greater Difficulty.
Firſt, The clear Examples are

1. The *Altar of Incenſe*. Only two Sides of it, *viz.* its Length and Breadth, are expreſſed by *Moſes*; each of them is affirmed to be one Cubit. Yet he declares that it was four ſquare: Whence we collect, that it was juſt one ſquare Cubit. See *Exod.* xxx. 2. Now it is demonſtrated in the *Appendix*, that one *Jewiſh* ſquare Cubit amounts to, in Surface, three *Engliſh* ſquare Feet, and about 47 ſquare Inches.

2. The *Table of Shew Bread*, *Exod.* xxv. 23. It is affirmed to be two Cubits in Length, and one in Breadth: None doubt but it was rectangular, containing two *Jewiſh* ſquare Cubits. Theſe amount to above ſix *Engliſh* ſquare Feet, and above half, *viz.* 94 ſquare Inches.

3. The *Boards of the Tabernacle*, each 10 Cubits in Length and 1 and a half in Breadth, *Exod.* xxvi. 16, being rectangular, muſt contain 15 ſquare Cubits, *Jewiſh*. Theſe are proved to contain very near 50 ſquare Feet of *Engliſh* Meaſure.

Secondly, The ſix Inſtances, or Caſes of greater Difficulty, reſerved to the Appendix, are

1. The *Mercy Seat*, whoſe Surface is = 12 ſquare Feet and a Half.

2. A general Method is taught of reducing any given Number of *Jewiſh* Cubits to *Engliſh* ſquare Feet.

3. The Example of the 15 ſquare Cubits in the *Boards of the Tabernacle* is made clearer.

4. The *Court of the Tabernacle*, deſcribed *Exod.* xxvii. 18, is found to be juſt Half the *Egyptian Aroura*, and to contain 1 Rood, 21 Perches, 27 ſquare Feet, *&c.*

5. The whole *Aroura* is determined, and reduced to our *Engliſh* Meaſures, *viz.* 3 Roods, 2 Perches, 55 ſquare Feet.

6. The *Suburbs* or *Glebe-Land*, given to each City of the *Levites*, *Numb.* xxxv. 3, 4, 5 is ſhewed to be a Square, on each of the four Sides of every City, containing a Million of *Jewiſh* ſquare Cubits, or 100 *Arouræ*; which amount to, in each Square, 76 Acres, 1 Rood, 20 Perches, 80 ſquare Feet: Whence we collect, that all the four Squares amounted to 305 Acres, 2 Rods, 1 Perch, 51 ſquare Feet.

TABLE

TABLE III.

Of Measures of Capacity.

	Wine Gall.	Pts.	In. fol.
An *Epha*, or *Bath* – – – – – – – –	7	4	15.
A *Chomer* (*Homer* in our Translation) – –	75	5	7.
A *Seah*, $\frac{1}{3}$ of an *Epha* – – – – – – –	2	4	3.
A *Hin*, $\frac{1}{6}$ of an *Epha* – – – – – – –	1	2	1.
An *Omer*, $\frac{1}{10}$ of an *Epha* (*Exod.* xvi. 36) –	0	6	0.5
A *Cab*, $\frac{1}{18}$ of an *Epha* – – – – – – –	0	3	10.
A *Log*, $\frac{1}{72}$ of an *Epha* – – – – – – –	0	$0\frac{1}{2}$	10.
The *Metretes* of *Syria* (*John* ii. 6.) = *Congius Romanus* or *Roman* Gallon – – – – – –	0	$7\frac{1}{8}$	0.
The *Cotyla*, Eastern, $\frac{1}{100}$ of an *Epha* – –	0	$0\frac{1}{2}$	3.

This *Cotyla* contains just 10 Ounces *Avoirdupois* of Rain Water

The *Omer* – – 100 d°
The *Epha* – – 1000 d°
The *Chomer* – – 10000 d°

So by these Weights all these Measures of Capacity may be expeditiously recovered, very near Exactness.

Note 1, *The above Measures, with Regard to their Quantities, are not exact in their several Parts, which inclines me to think they are erroneously printed in the Quarto Bibles (for they were taken from thence) though I imagin those Errors (if any) to be very small. However, whether right or wrong, I chose at this Time to copy them just as they are, till I can get an Opportunity of comparing them with some former Editions of that Bible; and also because they are said to be calculated by the Right Reverend* Richard, *Lord Bishop of* Peterborough.

2. *With Regard to the* Cotyla, *it is observed to weigh just* 10 *Ounces Avoirdupois of Rain Water, and to contain an* English *Wine Half Pint, and three solid Inches over. Now it is known that the Standard Wine Gallon contains* 231 *solid Inches, consequently the Wine Half Pint contains* 14 *solid Inches, and* .4375 *Parts of such an Inch: And from an Experiment made by the late Mr.* Ward (Young Math. Guide, p. 120) *a cubic Inch of common Water (he does not say whether Rain, River, or Spring Water) weighs* .578697 *Parts of an Ounce, that is very little more than Half an Ounce. Hence, if the* Cotyla *weighs just* 10 *Ounces Avoirdupois; the Cubic Inch of Water Half an Ounce, and that there are* 14 *Inches and almost an Half solid in a Wine Half Pint, the* Cotyla *will contain no more than Half a Pint Wine Measure, and* 2.843045 *solid Inches, as appears by the following Proportions, viz.*

oz. Cub. In. oz. Cubic In.
.578697 : 1 : : 10 : 17.280545+

Cub. In. half Pt. Cub. In.. half Pt. Cub. In.
14.4375 : 1 : : 17.280545 : 1 & 2.843045

And this is another Reason, why I imagin there must be some misprinting, which the future Time may possibly discover.

TABLE IV.

Of Weights and Coins.

Note 1. *The* Jewiſh *Weights are reduced to the Standard Grains of our* Troy *Weight (whereof* 438, *are equal to the* Roman Ounce) *and to our ancient* Avoirdupois Ounce.

2. *The Value of the* Jewiſh *and* Roman *Weights and Coins, at the preſent Rate of Silver and Gold, is expreſſed in Pence and Decimal Parts of a Penny.*

	Gr.	Pence.	£	s.	d.	qr.
A *Shekel* is the original Wt.	= 219.	= 28.2875	=0	2	4	1.15
A *Bekah*, $\frac{1}{2}$ of a *Shekel*	= 109.5	= 14.14375	=0	1	2	.14375
A *Gerah*, $\frac{1}{20}$ of a *Bekah* - -	= 10.95	= 1.414375	=0	0	1	1.6575
A *Maneh*, = 100 *Shekels* -	= 21900.	= 2828.75	=11	15	8	3.
A *Maneh*, (in Coin) = 60 *Shekels* - -	= 13140.	= 1697.25	=7	1	5	1.
A *Talent* of *Silver*, = 3000 *She.*	=657000.	=84862.5	=353	11	10	2.
A *Talent* of *Gold*, the ſame Weight			=5329	11	4	3.5

Note, *An Ounce of Standard Gold is worth* 3 *l.* 17 *s.* 10 *d.* 2 *qrs. then by the following Proportion it will be*

oz.	£	s.	d.		oz.	£	s.	d.	qrs.
1	3	17	$10\frac{1}{2}$	: :	657000	5329	11	4	3.5

	Gr.					
The Golden *Daries (Drams)* mentioned *Ezra* ii. 69, ſeem to be Coins of *Darius* the *Mede*. They weighed 12 *Gerahs* - - - - - - -	= 131.4	=0	1	4	3.89	

Roman Mony mentioned in the New Teſtament.

	d.	qrs.
A *Denarius*, Silver - - - =	7	3
An *Aſs*, Copper - - - =	0	3
An *Aſſarium* - - - - - =	0	$1\frac{1}{2}$
A *Quadrans* - - - - - =	0	$0\frac{3}{4}$
A *Mite* - - - - - - =	0	$0\frac{1}{3}$

AN

AN APPENDIX TO THE Second TABLE of MEASURES of SURFACE, Deſcribed by *MOSES*,

Shewing the Method of reducing them by Calculation, to the Meaſures *uſed in* England, *for the Benefit of thoſe who underſtand* Decimal Arithmetic, *and deſire to try the Reductions given in the Table, or to make further Improvements in this Kind of Meaſures.*

I Shall begin with Reduction of the Meaſures of the *Mercy-Seat*, which was God's Throne of Grace among the *Jews*. *Moſes* in *Exod.* xxv. 17, affirms, that its Length was two Cubits and an Half, its Breadth one Cubit and an Half. The Fractions adhering to its Length and Breadth, make ſome Difficulty to Beginners in Arithmetic, which the Decimal Way doth much abate. Suppoſing therefore, what in the Table is proved, that the *Jewiſh* Cubit was in Foot-Meaſure 1.824, the Length muſt then be 4.56 (for $1.824 \times 2.5 = 4.56$) and the Breadth muſt be 2.736 (for $1.824 \times 1.5 = 2.736$) wherefore the Product of theſe Numbers, *viz.* 4.56×2.736 gives its Surface 12.47616; if the Decimals be multiplied by 144 = the ſquare Inches in a Foot ſquare, the Product will be 68.56704 ſquare Inches, and ſomething above Half an Inch more.

2. In the Altar of Incenſe, *Exod.* xxx. 1, *Moſes* deſcribes the *Jewiſh* ſquare Cubit, which (as was ſaid before) was a Cubit long and a Cubit broad: Hence if the Length be multiplied by the Breadth, that is 1.824 by 1.824, the Product will be 3.326976, that is, 3 Feet and upwards: if the Decimals be multiplied by 144, the ſquare Inches in a Foot ſquare,

the

the Product will be 47.684544, that is, 47 ſquare Inches, and ſomething more than half an Inch; ſo that the Surface of the Altar of Incenſe, at the Top, was 3 Feet, 47 Inches and an Half ſquare. But the Altar had alſo four Sides, and was two Cubits high: Hence if the Height of the ſaid Altar be multiplied by the Breadth at the Top, that is, two Cubits by one Cubit, or 3.648 by 1.824, it will give the Dimenſions of each Side, becauſe they were all alike, *viz.* 6.653952, or 6 Feet and upwards of Half a Foot ſquare. If this Number be multiplied by 4, and the Top Surface added to it, that is, 6.653952 × 4 + 3.326976, the laſt Sum will give the whole Superficies of the ſaid Altar, *viz.* 29.942782, or very near 30 Feet ſquare. And as the Top and Sides were all overlaid with pure Gold, it muſt make the ſaid Altar, according to our preſent Eſtimation of that Metal, very rich and valuable. If the Size of this Altar be required as to its Bulk, or outſide Appearance, its Length was 1 Foot, 9 Inches, and .888 Decimal Parts of an Inch, its Breadth the ſame, and its Height 3 Feet, 7 Inches, and .776 Decimal Parts of an Inch; or, rejecting the Decimals, its Length was 1 Foot, 10 Inches, its Breadth 1 Foot, 10 Inches, and its Height 3 Feet, 8 Inches

By the ſame Rule we may form an Idea of the Bulk of the Ark of the Teſtimony, *Exod.* xxv. 10, which had the Mercy-Seat placed upon it, and the Teſtimony, which God gave to *Moſes*, put within it, and thence called the Ark of the Teſtimony. The length of this Ark was two Cubits and an Half, the Breadth one Cubit and an Half, and the Height one Cubit and an Half: and as it was overlaid within and without, with pure Gold, and the Mercy-Seat upon it all of ſolid pure Gold alſo, together with the two Cherubims, with their out ſtretched Wings, of the like ſolid Gold, it muſt have been vaſtly more valuable than the Altar of Incenſe.

By the Rule juſt mentioned, we come alſo at the Size of the Table of Shew Bread, *Exod.* xxv. 23, which was two Cubits long, one Cubit broad, and one Cubit and an Half high. Alſo the Curtains for the Tabernacle, which were 28 Cubits long, and 4 Cubits broad; and the Curtains of Goat's Hair, which were thirty Cubits long, and four Cubits broad. It is likewiſe as eaſy to diſcover the greateſt Size of the Altar of Burnt Offerings, mentioned *Exod.* xxvii. 1, which was five Cubits long, five Cubits broad, and three Cubits high: The Hangings for the Court of the Tabernacle, *Exod.* xxvii. 9, *&c.* which were Southward 100 Cubits long, and Northward 100

Cubits

Cubits long, alſo Weſtward 50 Cubits long, and Eaſtward 50 Cubits long, and all of them 5 Cubits high.

3. *Moſes*, in *Exod.* xxvi. 16, deſcribes the Boards of the Tabernacle, *viz.* ten Cubits in Length, and one Cubit and an Half in Breadth: Therefore to find the ſuperficial Content of each Board, we are only to multiply the Length by the Breadth. Now 10 Cubits are equal to $10 \times 1.824 = 18.24$ Feet; and one Cubit and an Half are equal to 2.736 Feet, therefore 18.24×2.736 will give 49.90464, that is, 50 ſquare Feet very near, for the Content of every Board of the Tabernacle.

4. We come next to the Meaſure of the Surface of Lands. And firſt of the Court of the Tabernacle, or the Ground on which the Prieſts performed all the ſolemn public Worſhip of *Iſrael*, in the Time of *Moſes*. The Area of this Court is deſcribed by *Moſes*, *Exod.* xxvii. 18, by its Length 100 Cubits, and its Breadth every where 50 Cubits: Wherefore this Area muſt be in *Jewiſh* Meaſure 5000 ſquare Cubits, that being the Product of 100 multiplied by 50. Now as 3.326976 Feet ſquare make a ſquare Cubit, that Number multiplied by 5000 will give 16634.88 for the *Engliſh* ſquare Feet, and Decimal Parts of a Foot. But becauſe ſuch long Numbers are not eaſily retained in our Memories, they may be reduced into Perches, or Roods, or Acres, which contain known Numbers of ſquare Feet. Thus, a Perch is 5 Yards and an Half, or 16 Feet and an Half long, and conſequently a ſquare Perch is 16 Feet and an Half long, and 16 Feet and an Half broad, making 272.25 ſquare Feet, or 272 ſquare Feet and one Quarter; a ſquare Rood contains 40 times as much, or 10890 ſquare Feet, and an Acre contains four times that Quantity, or 43560 ſquare Feet: Hence it appears that the aforementioned Area of the Court of the Tabernacle is greater than a Rood, and leſs than an Acre; but as Subtraction can be made but once, it appears that that Area is not ſo much as two Roods, though it is greater than one Rood: Then if the following Calculation take place, the Area will be 1 Rood, 21 Perches, 27 ſquare Feet, and a very little above half a Foot more.

Sq. Feet	*Rood*	*Sq. Feet.*	*R.*	*Per.*	*Feet.*
10890 :	1 : :	16634.88 :	1	21	27.62793

Hence it muſt be underſtood of the whole Piece of Ground, including that whereon the Tabernacle ſtood, as well as the Court round about the Tabernacle. However, leſt the Reader

er ſhould be at a Loſs to find out the foregoing Solution, it is given at large, as follows, *viz.*

Rood.

108910.) 16634.880010(1.527537
1089 40

5744 *Per.* 21.101480
5445 272.25 *Feet in* 1 *Perch.*

2998 507 40
2178 2029 6
20296
8208 71036
7623 20296

5850 27.6279300 *Feet*
5445

4050
3267

7830
7623

207

But reflecting upon the Meaſure by Cubits, uſed by *Moſes*, and finding them to be preciſely 5000 ſquare Cubits, it was obſerved by his Lordſhip of *Peterborough*, to be juſt Half 10000, which he had obſerved from *Herodotus*'s *Euterpe*, to be the Area of the *Egyptian Aroura*, by which their Land was as generally meaſured as ours is by Acres and Roods. See *Herodot.* l. 2. cap. 168. He called alſo to Mind a Paſſage in *Manetho*, an *Egyptian* Prieſt, cited by *Joſephus*, in his firſt Book againſt *Apion*, where he affirms that *Manetho*, in his Hiſtory of the Reign, Wars, and Expulſion of the *Paſtors* (whom *Africanus* affirms to be *Phœnicians*, or *Canaanites*, and *Joſephus* vainly believed to be *Jews*) wrote out of the public Records of *Egypt*, that theſe *Paſtors* made at *Abaris*, a very large and ſtrong Encampment, that encompaſſed 10000 *Arourœ* ſufficient to contain 240000 Men, and long enough to maintain their Cattle. Hence it appears, that not only the *Egyptians*, but the *Phœnicians* or *Canaanites* alſo, that had dwelt among them, and had reigned there during the Time of ſix Kings

Kings ſucceſſively, uſed this Meaſure of Land, called *Aroura*. Now this was long before the Time of *Moſes*; for the Beginning of *Amoſis* or *Tethmoſis*, who expelled them out of *Egypt*, was very near the Time of *Abraham*'s Death, as appears by the Annals of the late learned Primate of *Ireland* (whom I imagin to be Archbiſhop *Uſher*.) Wherefore I believe (ſays his Lordſhip of *Peterborough*) that *Moſes*, who was ſkilled in all *Egyptian* Learning, eſpecially ſurveying, did, of Choice, make the Court of the Tabernacle to be juſt Half an *Aroura*, which was a known Meaſure to him and his People, who had long dwelt in *Egypt*, and Divine Authority directed him ſo to do.

5. It was made to appear from *Herodotus*, that an *Aroura* is the ſquare of 100 *Jewiſh* or *Egyptian* Cubits, and 100 ſuch Cubits contain 182 Feet, and .4 in *Engliſh* Meaſure (for 1.824 × 100 = 182.4) it follows that 182.4 × 182.4 = 33269.76 ſquare Feet, equal to the ſquare Feet in an *Egyptian Aroura*, equal to 3 Roods, 2 Perches, 55 ſquare Feet, and little more than a Quarter of a Foot; as appears by the following Arithmetic, the Proportion being the ſame as before.

Sq. Feet.	*Rood.*	*Sq. Feet.*	*R.*	*P.*	*Sq. Feet.*
10890	1	33269.76	3	2	55.25586

Note, *The fourth Term is found in the ſame Manner as that is, which diſcovers the Area of the Tabernacle, and for that Reaſon the Operation at large is omitted*

To this Place may be referred the Uſe of the leſſer Sort of χοῖνιξ, *Choinos*, which yet is moſt convenient for the Uſe of the *Egyptians*, and of the *Jews*, to meaſure out private Mens Inheritances, by a Line which was 80 Cubits long. For the Length of this Line will meaſure one Side of an *Aroura*, if the other Side be 125 Cubits long, which is the Length of this Line, and its Half, and 5 Cubits above Half of it, which they might eaſily mark in it, by a Knot or a Ring. And by this Means, they might eaſily lay any Number of *Arouræ* together, all of them rectangular, and parallel to each other. Such Lines, his late Lordſhip of *Peterborough* ſuppoſed for Meaſure of Inheritances, are intimated *Pſalm* xvi. 6, where it is ſaid *The* Lines *are fallen unto me in pleaſant Places*; *yea, I have a goodly* Heritage. Alſo *Pſalm* lxxviii. 55, *He caſt out the Heathen alſo before them (i. e.* the *Jews) and divided an Inheritance by* Line, *and made the Tribes of* Iſrael *to dwell in their Tents.* See the new or Bible Tranſlation.

6. The laſt Particular, which I ſhall take Notice of, relating to the *Jewiſh* Meaſures, is concerning the Suburbs or Glebe Land given to each City of the *Levites*, mentioned

Numbers

Numbers xxxv. 3, 4, 5, which runs thus, *And the Cities ſhall they have to dwell in, and the* Suburbs *of them ſhall be for their Cattle, and for their Goods, and for all their Beaſts. And the* Suburbs *of the Cities, which ye ſhall give unto the* Levites, *ſhall reach from the Wall of the City outward,* a thouſand Cubits *round about. And ye ſhall meaſure from without the City, on the Eaſt-Side* two thouſand Cubits, *and on the South Side* two thouſand Cubits, *and on the Weſt-Side* two thouſand Cubits, *and on the North-Side* two thouſand Cubits: *And the City ſhall be in the midſt: This ſhall be to them the* Suburbs *of the Cities.* Here *Moſes* deſcribes what Meaſure of Land the *Levites* were to be allowed for their Cattle, their Goods, and all their Beaſts, on the North, Eaſt, South and Weſt-Sides of each of their Cities: So that the City was to be exactly in the midſt of the Land belonging to it. This Land in our Tranſlation is called *Suburbs*, becauſe of its nearneſs to all their Cities. But we muſt not thence imagin, that it means Houſes and Streets, adjoining to their Streets, in which Senſe we ſometimes uſe the Word Suburbs. For *Moſes* plainly tells us they were Places for their ſeveral Sorts of Cattle to feed in, ſuch as might alſo be Orchards or Gardens for Fruits, or perhaps for a little Corn, comprehended in the Words *their Goods.* Theſe Fields, Orchards, or Gardens, he limits by 1000 Cubits, which was juſt a Quarter of an Eaſtern Mile, but amounts, in meer Length, to 608 Yards *Engliſh* Meaſure, thus,

Foot.

A Cubit = 1.824

1000

3)1824.000(608 Yards

this therefore exceeds a Quarter of an *Engliſh* Mile, by 168 Yards in Length; thus,

4)1760 Yards make a Mile — 608

440 Yards make a Quarter of a Mile — 440

168 Yds.

But it is certain that Cattle cannot feed upon meer Length, any more than Orchards or Gardens can conſiſt of ſuch lineal Meaſure: The 1000 Cubits therefore, juſt mentioned, muſt ſignify the Side of ſome Surface of Land bounded thereby, and we muſt have two Sides of that Surface given, before we can find the Area, or Surface contained. Therefore *Moſes, ver.* 5, tells us, that on each Side of every City they muſt meaſure 2000 Cubits,

Cubits, which will determin no Surface, unleſs we underſtand it to mean the two Sides of a Square, bounded on every Side by 1000 Cubits; theſe two Sides multiplied into each other, will produce a Square, that contains juſt a Million of ſquare Cubits; thus,

1000
1000

1000000 Square Cubits.

and that is a known and exact Meaſure of juſt 100 *Arourœ*: and this ſhews that the 2000 Cubits mentioned *ver.* 5, are the two Sides of that Square, whereof the 1000 Cubits mentioned *ver.* 4, is one of thoſe Sides, and may be called the Root of the Square. This ſhews the Agreement of the two different Numbers; and to find the ſuperficial Content of a Square, each of the Sides of which are 1000 Cubits, the following Arithmetic will determin, though it ſtands a little contracted.

1. 1000 Cubits are equal to 1824 *Engliſh* Feet.
2. 1824 × 1824 = 3326976 Feet ſquare.
3. A ſquare Acre contains 43560 Feet ſquare.
4. 43560) 3326976(76.376859
4

1.507436
40

20.297440

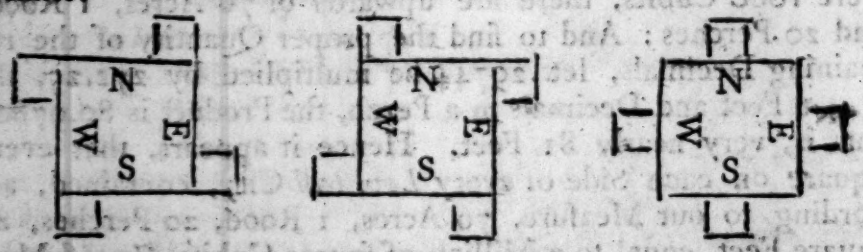
Hence it appears, that in a Square, each of whoſe Sides were 1000 Cubits, there are upwards of 76 Acres, 1 Rood, and 20 Perches: And to find the proper Quantity of the remaining Decimals, let .29744 be multiplied by 272.25, the ſquare Feet and Decimals in a Perch, the Product is 80.97804 that is, very nearly 81 Feet. Hence it appears, that every Square on each Side of every *Levitical* City, contained, according to our Meaſure, 76 Acres, 1 Rood, 20 Perches, 81 ſquare Feet, equal to a Million of ſquare Cubits, *Jewiſh* Meaſure; and if the Sum of the four Squares belonging to each City be required, you need only multiply the Content of one

Square

Square by four, and you have the whole Content of the Ground belonging to each City; thus,

A.	R.	P.	Sq. F.	
76	1	20	81	the ſuperficial Content on each Side.
			4	
305	2	0	324	
			272.25	ſquare Feet in a Perch.
305	2	1	51.75	

But here is one Particular more to be obſerved, which is no where mentioned in ſacred Writ; and that is, the ſeveral ſuperficial Contents of the Ground on which every City ſtood; whether they were all alike, or whether one City was greater than another. Now as the Scriptures are intirely ſilent in this Reſpect, we are left wholly to Conjecture; and as there is as much Reaſon to imagin they were all alike, as that they were not ſo; I ſee no Harm, if for once, we ſuppoſe them all of a Size, ſince for Regularity's Sake, it is no way inconſiſtent; and that there might be Room enough for Families to increaſe for a long Time, it is not contradictory to Reaſon, to ſuppoſe the Quantity of Ground aſſigned for each City to be very ſuperior, in Proportion to the Number of Inhabitants at that Time to make up that City, and that each City was an exact Square. However, we are yet at a Loſs to know how the Suburbs belonging to each City were placed, though they were all of them to take the Beginning of their Meaſurements from the ſeveral Walls of each City; and among the ſeveral Ways of placing the Suburbs, there ſeems to me to be but three, which may be called regular, each of which I ſhall exhibit in Lines geometrically, to help the Idea of the Reader,



As the *Levites* were to have 48 Cities, with their Suburbs, it will be very eaſy at any time, to find the whole Quantity of Ground belonging to all the Suburbs, by multiplying the Quantity

Quantity of Ground contained in the Suburbs of one City by 48, or by the Parts thereof, which will produce 14666 Acres, 2 Roods, very little more or leſs, rejecting ſome ſmaller Quantities, which in this Caſe are trifling.

Note, *In* Exod. xxix. 40, *Mention is made of a Tenth-deal of Flour; but what that Quantity is, in our Meaſure, I am at a Loſs to know at preſent. However I choſe juſt to mention it here, that it might not appear to be either overlook'd or forgot.*

Before this Part is quitted, it will be worth the while to make an Obſervation concerning Ingenuity, or Perfection in Workmanſhip.

Fine Performances of any Kind, are, and always have been, very much valued, and juſtly eſteemed: And Hiſtory will furniſh us with ſingular Productions, more than enough for our preſent Purpoſe. But without enumerating any of them, we may challenge the whole World to produce ſuch Pieces of Mechaniſm, by their own Inventions, as were wrought by Men, who were immediately inſtructed by the great Creator of the Univerſe: Nor can any Performances, how beautiful and ingenious ſoever they be, ſtand in Competition with thoſe which were wrought by divine Inſpiration. We have God Almighty's own Word for it, *Exod.* xxviii. 2, 40, that they were to be made for *Glory* as well as *Beauty*; and *Exod.* xxxi. 2, and following Verſes, that *Bezaleel*, *Aholiab*, and others, were thoſe inſpired Perſons who were to make all thoſe *glorious* and *beautiful* Works; conſequently all meer human Pieces of Mechaniſm, even the very beſt of them, muſt fall vaſtly ſhort of that Perfection, which was ſeen in the Workmanſhip *of the Tabernacle of the Congregation, and the Ark of the Teſtimony, and the Mercy-Seat, and all the Furniture of the Tabernacle, and the Table and his Furniture, and the pure Candleſtic with all his Furniture, and the Altar of Incenſe, and Altar of burnt Offering with all his Furniture, and the Laver and his Foot, and the Clothes of Service, and the holy Garments for Aaron, and of his Sons, to miniſter in the Prieſt's Office:* And ſince theſe Men were filled *with the Spirit of God in Wiſdom and Underſtanding, and in Knowledge, and in all Manner of Workmanſhip, to deviſe cunning Works, to work in Gold, and in Silver, and in Braſs, and in cutting of Stones to ſet them, and in carving of Timber*, what could the Workmanſhip of all theſe be leſs than exquiſitly curious, even in the moſt Superlative Degree! Certainly, if ever Art could be ſaid to have arrived to any Degree of Perfection, it was in the *Tabernacle* of God, and all its *Apparatus*, which were really Maſter-Pieces of their Kind; ſuch as for *Glory and Beauty of Workmanſhip*,

Workmanſhip, the World never ſaw before, nor will ever ſee again. And becauſe ſome Men have already entertained, and others I fear do ſtill entertain, mean and contemptible Thoughts of, and ſtrongly object againſt all the aforementioned holy Works, which were directed by God himſelf, and ſhewn to *Moſes* by way of Pattern, while he was with God on the Mount, I have made Choice of the foregoing Argument to cloſe this Appendix with, in order to obviate, as much as poſſible, all ſuch vain and ſinful Objections.

Miſcellaneous Arithmetic:

OR A FULL

ACCOUNT of the NEW CALENDAR, &c.

PART III.

Of the NEW CALENDAR.

1. *Of the Golden Number.*

THE *Golden Number*, which is alſo called the *Prime*, is a circular Revolution of nineteen Years, in which Time it hath been ſuppoſed, the Sun and Moon do finiſh their Variety of Aſpects.

RULE.

When 1 to th' Year hath added been,
That Sum divide by juſt 19.
By th' Quote, the Revolution's ſhewn;
Th' Remainder is the Prime well known.

Note 1, *One is added to the given Year, becauſe this Revolution began one Year before the Birth of Chriſt.*

2. *If nothing remains, the Golden Number is* 19, *and the given Year is the laſt Year of the Revolution.*

3. *The Prime changeth the firſt Day of* January.

4. *It is called the Golden Number, becauſe anciently, it uſed to be ſet down in the Calendar in Golden Letters.*

EXAMPLE.

What is the Golden Number for the Year 1764?

1764
1

19)1765(92
171

55
38

17

Anſwer. *The Golden Number is* 17, *and there have been* 92 *Revolutions ſince the Birth of Chriſt.*

2. Of

2. Of the CYCLE of the SUN.

THE Cycle or Circle of the Sun is a Revolution of 28 Years, in which Time all the Variety of Dominical Letters and Leap Years expire; except in the Year 1800, which will make ſome Alteration.

RULE.

To th' given Year add 9 complete;
That Sum divide by 28:
The Quote, the Revolutions tell,
Th' Remainder ſhews the Cycle well.

Note 1, *Nine is added to the given Year, becauſe this Revolution began nine Years before the Birth of Chriſt.*

2. *If nothing remains, the Cycle is* 28, *and the given Year is the laſt Year of the Cycle or Revolution.*

3. *The Cycle changes the firſt Day of* January.

EXAMPLE.

What is the Cycle of the Sun for the Year 1764?

1764
9

28)1773(63
168

93
84

9

Anſwer. *The Cycle is* 9, *and there has been* 63 *Revolutions.*

3. Of the EPACT.

THE Epact is 11 Days nearly, which the Moon wants of the Solar Year, which is 365 Days, 5 Hours, 48 Minutes, and 55 Seconds, whereas the Lunar Year is but 354 Days, 8 Hours, 48 Minutes, and 38 Seconds: Or, it is the Moon's Age at the Beginning of *January*.

RULE.

Take 1 from the Prime, multiply 't by 11,
Divide that by 30, the Epact is given.

EXAMPLE.

EXAMPLE.

What is the Epact for the Year 1764?

The Prime, or Golden Number, is	17
From which ſubtract	1
And there remains	16
This multiply by	11
And divide by	30)176(5
	150
The Epact *is*	26

Note 1. *The* Epacts *are the ſame every* 19 *Years*

2. *The* Epact *changes the firſt Day of* January.

3. *One is taken from the Prime, becauſe the Prime began* 1 *Year before the Birth of* Chriſt

4. *The* Epacts *always proceed by the Addition of* 11, *till the* Golden Number *happens to be* 19, *and then the Number* 12 *is added for the* Epact *of the following Year.*

5. *As often, as by the Addition of ſeveral* Epacts *together, the Number* 30 *ſhall be included in the Sum,* 30 *muſt be taken away, and what remains is to be retained for the* Epactal *Number of the following Year; hence every third Year in which* 30 *is caſt away, there happens an* Emboliſmical Moon, *that is,* 13 *Moons in that Year; the laſt Moon in that Year being the* Intercalary *or* Emboliſmical *Moon.*

6. *The Quotient of the Diviſion by* 30, *ſhews how many* Emboliſmical Moons *have happened ſince the firſt Year of that* Cycle.

7. *By the foregoing* Rule, *the following* Table *is calculated, as appears from the above Operation, where the* Golden Number *being* 17, *the* Epact *is* 26.

A TABLE of the EPACTS for every Golden Number.

Golden Numbers.	Epacts.	Golden Numbers.	Epacts.	Golden Numbers.	Epacts.
I	30 or 0	VIII	17	XV	4
II	11	IX	28	XVI	15
III	22	X	9	XVII	26
IV	3	XI	20	XVIII	7
V	14	XII	1	XIX	18
VI	25	XIII	12		
VII	6	XIV	23		

Its USE.

It is only of uſe to know, at Sight, what *Epact* belongs to any particular *Golden Number.*

4. Of

4. Of BISSEXTILE or LEAP YEAR.

LEAP YEAR has one Day more in *February* than any other Year; becauſe the common Year, or Courſe of the Sun, is computed to be ſix Hours more than 365 Days, which in four Years Time make a Day, called in the ancient Roman Calendar *Biſſextile*, which Day was then appointed to be the Day before the 24th Day of *February*.

By the Statute *De anno biſſextile*, 21 *Hen.* III. *Anno Dom.* 1236, to prevent Miſunderſtandings, the intercalary Day, and that next before it, are to be accounted as one Day: Though Aſtronomers do not regard it now, becauſe St. *Matthias*'s Day is placed on the 24th of *February*, both in a common Year and Leap Year, which otherwiſe, in a Leap Year uſed to be on the 25th Day, they placing the intercalary Day next after the 28th, which makes in the Leap Year 29 Days.

The Statute runs thus,

The King unto his Juſtices of the Bench, greeting. Know ye, That where within our Realm of England, *it was doubted of the Year and Day that were wont to be aſſigned unto ſick Perſons being impleaded, when and from what Day of the Year going before unto another Day of the Year following, the Year and Day in the Leap Year ought to be taken and reckoned how long it was.*

II. *We therefore, willing that a Conformity be obſerved in this Behalf every where within our Realm, and to avoid all Danger from ſuch as be in Plea, have provided, and by the Counſell of our faithfull Subjects, have ordained, That, to take away from henceforth all Doubt and Ambiguity that might ariſe hereupon, the Day increaſing in the Leap-Year ſhall be accounted for one Year, ſo that becauſe of that Day none ſhall be prejudiced that is impleaded, but it ſhall be taken and reckoned of the ſame Month wherein it groweth, and that Day, and the Day next going before, ſhall be accounted for one Day. And therefore we do command you, that from henceforth you do cauſe this to be publiſhed afore you, and be obſerved. Witneſs myſelf at Weſtminſter,* &c. Vid. *Keble*'s Statutes at Large, p. 9 and 10.

But as this Method of allowing the *Julian* Year to conſiſt of 365 Days, 6 Hours, inſtead of 365 Days, 5 Hours, 48 Minutes, 55 Seconds, which is the true Solar Year, has obtained ſince the Reformation of the Calendar by the Council of *Nice*, in the Year 325, to the Year 1751 incluſive, it has brought the Equinoxes and Solſtices 11 Days nearly, or 10 Days, 23 Hours, 24 Minutes, 50 Seconds, earlier than by the *Julian* Account they are ſuppoſed to be. As appears by multiplying

multiplying the Difference between the Julian Year and the true ſolar Year, by the Difference between the Years 325 and 1751.

Thus 365 *D.* 6 *hrs.* — 365 *D.* 5 *hrs.* 48 *m.* 55 *ſec.* = 11 *m.* 5 *ſ.*
Again 1751 — 325 = 1426

	M.	*Sec.*		*Days.*	*hrs.*	*min.*	*ſec.*
Laſtly	11	5 × 1426	=	10	23	24	50

In plain Numbers thus.

	D.	*h.*	*m.*	*ſ.*	*Yrs. of our Lord.*
Julian Year	365	6	0	0	1751
Solar Year	365	5	48	55	325
Difference	0	0	11	5	1426

M. ſec.
11 5
60
665
1426
3990
1330
2660
665
610

610)9482910(15801 4(263(10 23 24 50
50
24
23

24 *D. h. min. ſec.*

RULE.

Divide the Year by 4, what's left ſhall be
For Leap Year 0, for paſt, 1, 2, or 3.

Note, *This* Rule, *ſince the Act for regulating the Commencement of the Year, will not always be true: for neither the ſeveral Years* 1800, 1900, 2100, 2200, 2300, *nor any other hundredth Year of our Lord, where the even Hundreds are not diviſible by* 4 *without a Remainder, will be* Leap-Years. *But in all other Reſpects the common Years will be the ſame, and the* Leap Years *will contain* 366 *Days, as uſual: but becauſe in every* 400 *Years, by admitting the Year to be* 365 *Days,* 6 *Hours, and the* Leap Year *to conſiſt of* 366 *Days, there will be gained* 3 *D.* 1 *h.* 53 *m.* 20 *ſ. therefore one Day is taken off from every hundredth Year, where the Hundreds are not diviſible by* 4, *which will be* 3 *times in every* 4 *hundred Years, making*

just 3 *Days. By this Means the* Equinoxes *and* Solſtices *are brought back again to their proper Days. This Method is not exact, but the Error is ſo ſmall as to leave an Exceeding of only* 1 *h.* 53 *m.* 20 *ſec. in* 400 *Years, which will not amount to* 24 *Hours in* 5082 *Years, as appears by the following Calculation, viz.*

665 = the Seconds gain'd in 1 Year.

400

60 24 *D. h. m. ſec.*

60)266000(443(73(3 1 53 20
20 53 1

Now the 3 *Days being taken off as before mentioned, there will remain only* 1 *h.* 53 *m.* 20 *ſec. then by the Rule of Three,*

H. m. s. Yrs. hrs.

1 53 20 : 400 : : 24
60 60

113 1440
60 60

6800 86400
400

Yrs.

6800)34560000(5082 $\frac{24}{68}$
340

560
544

160
136

24

EXAMPLES.

1. The Year 1764, is it a common Year or Leap Year?

4)1764(441

Anſw. *Biſſextile or Leap Year, becauſe nothing remains.*

2. The Year 1765, is it a common Year or Leap Year?

4)1765(441
1

Anſw. *A common Year, or the firſt after Biſſextile or Leap Year.*

5. Of the DOMINICAL LETTER.

THE *Dominical Letter* is one of the firſt ſeven Letters of the Alphabet in the Calendar expreſſing *Sunday*, from *Dominicalis*, belonging to *Sunday* or the Lord's Day.

RULE.

RULE.

The Year, it's Fourth and 1 together add;
Let 7 divide: What's left, the Letter's had.

Note 1, *In every Leap-Year there are two* Dominical Letters; *one serves to the 29th of* February *(which before used to be the 25th, according to the Act of King* Henry III.) *and the other to the End of* December.

2. *This Rule finds only the latter* Dominical Letter *in Leap-Year.*

3. *The* Dominical Letter *goes backward in a common Year one Letter, but in Leap-Year two Letters.*

4. *This Rule finds the* Dominical Letter *till the Year* 1799 *inclusive: but from* 1800 *to the Year* 1899 *both inclusive, you must add to the current Year only its fourth Part.*

EXAMPLE.

What is the Dominical Letter for the Year 1764?

The Year – – 1764
Its Fourth – – 441
Add – – – 1

7)2206(315 & 1 over = G.

according to the annexed Table.

0	A
1	G
2	F
3	E
4	D
5	C
6	B

Another Way to find the Dominical Letter.

RULE.

Add the Year and its Fourth, then divide by just 7.
What's left take from 7, the Letter is given.

EXAMPLES.

1. What is the Dominical Letter for the Year 1764?

4)1764
441

7)2205(315

7 – 0 = 7 = G

1	A
2	B
3	C
4	D
5	E
6	F
7	G

2. What is the Dominical Letter for 1765?

4)1765
441

7)2206(315
1

7 − 1 = 6 = F

Note, *I have uſed this Method in the Rule for finding of* Eaſter-Day.

6. To find what Day of the WEEK, any Day of any MONTH falls on.

FIND the Dominical Letter (which expreſſes *Sunday*) for the Year given; and with it reckon downward in the Calendar, in the Month given, till you come to the given Day, which ſhews the Day of the Week required.

Note, *In Almanacs, the* Dominical Letter *is known by its being a* Red *and* Capital Letter.

When any Calendar is wanting obſerve this

RULE.

At *Dover* dwells *George Brown*, Eſquire,
Good *Caleb Finch*, and *David Fryer*.

Here it is to be obſerved, that each Line contains ſix Words, anſwering to ſix Months, and the firſt Letter of each Word is the Letter of the firſt Day of each Month in order, as

Jan. A. *Feb.* D. *Mar.* D. *Apr.* G. *May* B. *June* E.
July G. *Aug.* C. *Sept.* F. *Oct.* A. *Nov.* D. *Dec.* F.

So then knowing the Dominical Letter, and the Letter belonging to the firſt Day of the Month, 'tis eaſy to find the Day of the Week required.

EXAMPLE.

What Day of the Week will *December* the 5th be in the Year 1765?

The Dom. Letter for the Year 1765 is F.

1 f or *Sunday*
2 g *Monday*
3 a *Tueſday*
4 b *Wedneſday*
5 c *Thurſday*

Anſw. Thurſday.

7. Of

7. Of EASTER LIMIT.

EASTER LIMIT is the Paſchal full Moon, and is an uncertain Number of Days from *March* 1, incluſive, and helps to find *Eaſter-Day*.

Note, *It is called an uncertain Number of Days from* March 1, *becauſe it is in one Year more, and in another leſs.*

RULE.

The Epact, more 6, from which 30 reject;
That taken from 50, gives the Limit direct,
Which if it exceed 31, this pray do,
Reject *March*'s Days, and 'twill *April*'s Day ſhew.

EXAMPLES.

1. What is *Eaſter* Limit for the Year 1764?

Epact = 26
Add - 6

32 *which becauſe it is more than* 30
ſubtract 30 *from it*

2 *which ſubtracted*
from - 50

The Remainder, or Limit is 48 *Days from* March 1.
Subtract 31 *for the Days in* March

Remainder is the 17*th Day of* April.

2. What is *Eaſter* Limit for 1765?

Epact - 7
Add - 6

13 *which becauſe it is leſs than* 30
Subtract from 50

The Remainder, or Limit is 37 *Days from* March 1
Subtract 31 *for the Days in* March

Remainder is the 6*th Day of* April.

According to this Method, the following Table of *Easter* Limits, or Paschal Full Moons, is calculated; the Golden Numbers and Epacts being first known, as before taught.

A TABLE of the Golden Numbers, Epacts and Paschal Full Moons, for every 19 Years, till the Year 1899 inclusive.

Golden Numbers	Epacts	Paschal Full Moons.	Golden Numbers	Epacts	Paschal Full Moons.
I	0	April 13	XI	20	March 24
II	11	2	XII	1	April 12
III	22	March 22	XIII	12	1
IV	3	April 10	XIV	23	March 21
V	14	March 30	XV	4	April 9
VI	25	April 18	XVI	15	March 29
VII	6	7	XVII	26	April 17
VIII	17	March 27	XVIII	7	6
IX	28	April 15	XIX	18	March 26
X	9	4			

From this Table, calculated according to the orderly Proceeding of the Golden Numbers, is framed the following Table for finding of *Easter Day*, as it stands in the Act of Parliament for regulating the Commencement of the Year; and for correcting the Calendar now in Use; and also in the Common Prayer-Books, before the Order for Morning Prayer.

A TABLE

A TABLE to find EASTER-DAY till the Year 1899 inclusive.

Golden Number.	Day of the Month.	Sunday Letter.
14	Mar. 21	C
3	22	D
	23	E
11	24	F
	25	G
19	26	A
8	27	B
	28	C
16	29	D
5	30	E
	31	F
13	Apr. 1	G
2	2	A
	3	B
10	4	C
	5	D
18	6	E
7	7	F
	8	G
15	9	A
4	10	B
	11	C
12	12	D
1	13	E
	14	F
9	15	G
	16	A
17	17	B
6	18	C
	19	D
	20	E
	21	F
	22	G
	23	A
	24	B
	25	C

The Conſtruction.

This Table is made by ſetting down the Days of the Month in their natural Order, and the *Sunday* Letters againſt them, the ſame as they are in the Calendar, or the common Almanacs; and then place ſuch Golden Number againſt its Day, as the preceding Table directs, and thus is the Table compleated.

Uſe.

This Table contains ſo much of the Calendar as is neceſſary for the determining of *Eaſter*; to find which

1. Look for the Golden Number of the Year in the firſt Column.

2. Againſt that ſtands the Day of the Paſchal Full Moon, in the ſecond Column.

3. Look in the third Column for the Dominical or *Sunday* Letter for the ſame Year, next after the Day of the Full Moon.

4. The Day of the Month, in the ſecond Column, ſtanding againſt that *Sunday* Letter is *Eaſter Day*.

Note, If the Full Moon happens upon a *Sunday*, then the next *Sunday* after is *Eaſter-Day*.

Example. What is *Eaſter-Day* for 1764?

The Golden Number for that Year is 17, and the Dominical Letter is G.

1. Look for 17 in the firſt Column.

2. Againſt it ſtands *April* 17, in the ſecond Column.

3. Guide your Finger downward in the third Column till you come to G.

4. Againſt it, in the ſecond Column is *April* 22, which is *Eaſter-Day*.

8. Of EASTER-DAY.

EASTER-DAY, on which all the other moveable Feasts depend, is always the first *Sunday* after the Full Moon, which happens upon, or next after the 21st Day of *March*; and if the Full Moon happens upon a *Sunday*, *Easter-Day* is the *Sunday* after, and never happens before *March* 22, nor after *April* 25.

RULE.

First take from the Limit the * Letter and 4;
What's left from next 7's take, but nothing more;
This add to the Limit, and then you will see
What Day of the Month in *March Easter* will be:
Which Number, if more 'tis than 30 and 1,
Subtract *March*'s Days, then for *April* 'tis done.

* Note, *By the* Letter, *is to be understood the second Way of finding the* Dominical Letter, *as before mentioned.*

EXAMPLES.

1. What is *Easter-Day* for 1764?

The Dominical Letter is G- - - = 7
To which add - - - - - - - - 4
The Sum is - - - - - - - - - 11
Which subtract from Easter Limit - 48
The Remainder is - - - - - - 37
Which subtract from nearest 7's - - 42
The Remainder is - - - - - - 5
To which add Easter Limit - - - 48
The Sum is - - - - - - - - - 53
From which take the Days in March 31
Remainder is the - - - - - - 22d *Day of* Apr.

2. What is *Easter-Day* for 1765?

The Dominical Letter is F - - = 6
Add - - - - - - - - - - 4
The Sum is - - - - - - - - - 10
Which subtract from Easter Limit - 37
The Remainder is - - - - - - 27
Which subtract from nearest 7's = 28
The Remainder is - - - - - - 1
To which add Easter Limit - - 37
The Sum is - - - - - - - - - 38
From which take the Days in March 31
Remainder is the - - - - - - 7*th Day of* Apr.

Another TABLE to find EASTER-DAY till the Year 1899 inclusive.

SUNDAY LETTERS.							
G. N.	A	B	C	D	E	F	G
I	Apr. 16	17	18	19	20	14	15
II	Apr. 9	3	4	5	6	7	8
III	Mar. 26	27	28	29	23	24	25
IV	Apr. 16	17	11	12	13	14	15
V	Apr. 2	3	4	5	6	Mar. 31	Apr. 1
VI	Apr. 23	24	25	19	20	21	22
VII	Apr. 9	10	11	12	13	14	8
VIII	Apr. 2	3	Mar. 28	29	30	31	Apr. 1
IX	Apr. 16	17	18	19	20	21	22
X	Apr. 9	10	11	5	6	7	8
XI	Mar. 26	27	28	29	30	31	25
XII	Apr. 16	17	18	19	13	14	15
XIII	Apr. 2	3	4	5	6	7	8
XIV	Mar. 26	27	28	22	23	24	25
XV	Apr. 16	10	11	12	13	14	15
XVI	Apr. 2	3	4	5	Mar. 30	31	Apr. 1
XVII	Apr. 23	24	18	19	20	21	22
XVIII	Apr. 9	10	11	12	13	7	8
XIX	Apr. 2	Mar. 27	2	29	30	31	Apr. 1

The Conſtruction of the foregoing Table.

It has been found by Calculation, that whatever *Golden Number* and *Dominical Letter* happens in any one Year, whenever they occur afterwards, they produce the ſame Day of the ſame Month for *Eaſter-Day* that they did before. Hence it follows, that whenever the *Golden Number* happens to be 1, and the *Dominical Letter* A, *Eaſter Day* will then be on the 16th Day of *April:* The ſame Number and B makes *Eaſter Day* fall on the 17th Day of *April:* The ſame Number and C makes *Eaſter Day* fall on the 18th Day of *April*, &c.

Again, When the *Golden Number* is 2, and the Letter is A, *Eaſter-Day* will be on *April* 9: The ſame Number and B, makes it *April* 3, *&c.* After the ſame Manner is the whole Table formed.

EXAMPLES at large.

1. What will *Easter-Day* be, when the Golden Number is 1, and the Dominical Letter A?

1	*Epact* 0	A = 1
1	6	4
0	6	5
11	50	*Easter Lim.* 44
30)0(0 *Easter Lim.* 44		39
0 *Epact*		*nearest* 7's 42
		3
		Easter Lim. 44
		47 *Days from* March 1
		31
		Answer 16*th of* April

2. What will *Easter-Day* be, when the Golden Number is 1, and the Dominical Letter B?

The Golden Number being 1, the Epact and *Easter* Limit are the same as above.

B =	2
	4
	6
Easter Limit	44
	38
nearest 7's	42
	4
Easter Limit	44
	48 *Days from* March 1
	31
	17*th Day of* April.

A TABLE of the MOVEABLE FEASTS, according to the ſeveral Days that EASTER can poſſibly fall upon.

Sundays after Epiphany.		Septuageſima Sunday. Com. Yr.	Septuageſima Sunday. Leap Yr.	Aſh-Wedneſday. Com. Yr.	Aſh-Wedneſday. Leap Yr.	Eaſter Day.	Aſcenſion Day.	Whitſunday.	Sundays after Trinity.	Advent Sunday.
1		Jan. 18	Jan. 19	Feb. 4	Feb. 5	Mar. 22	Apr. 30	May 10	27	Nov. 29
1		19	20	5	6	23	May 1	11	27	30
1	2	20	21	6	7	24	2	12	27	Dec. 1
2		21	22	7	8	25	3	13	27	2
2		22	23	8	9	26	4	14	27	3
2		23	24	9	10	27	5	15	26	Nov. 27
2		24	25	10	11	28	6	16	26	28
2		25	26	11	12	29	7	17	26	29
2		26	27	12	13	30	8	18	26	30
2	3	27	28	13	14	31	9	19	26	Dec. 1
3		28	29	14	15	April 1	10	20	26	2
3		29	30	15	16	2	11	21	26	3
3		30	31	16	17	3	12	22	25	Nov. 27
3		31	Feb. 1	17	18	4	13	23	25	28
3		Feb. 1	2	18	19	5	14	24	25	29
3		2	3	19	20	6	15	25	25	30
3	4	3	4	20	21	7	16	26	25	Dec. 1
4		4	5	21	22	8	17	27	25	2
4		5	6	22	23	9	18	28	25	3
4		6	7	23	24	10	19	29	24	Nov. 27
4		7	8	24	25	11	20	30	24	28
4		8	9	25	26	12	21	31	24	29
4		9	10	26	27	13	22	June 1	24	30
4	5	10	11	27	28	14	23	2	24	Dec. 1
5		11	12	28	29	15	24	3	24	2
5		12	13	Mar. 1		16	25	4	24	3
5		13	14	2		17	26	5	23	Nov. 27
5		14	15	3		18	27	6	23	28
5		15	16	4		19	28	7	23	29
5		16	17	5		20	29	8	23	30
5	6	17	18	6		21	30	9	23	Dec. 1
6		18	19	7		22	31	10	23	2
6		19	20	8		23	June 1	11	23	3
6		20	21	9		24	2	12	22	Nov. 27
6		21	22	10		25	3	13	22	28

Note, *This* Table *appears as if it was copied from that in the late Act for correcting the Commencement of the Year, &c. but it was made by me ſeveral Years before that Act took Date.*

Let this Table front p. 107.

Its Uſe.

Find the *Sunday* Letter for the given Year, in the uppermoſt Line, and the Golden Number in the Column of Golden Numbers; againſt the ſaid Golden Number in the ſame Line, and directly under the *Sunday* Letter, you have the Day of the Month on which *Eaſter* falleth that Year.

Note, *The Name of the Month is ſet on the Left Hand, or juſt with the Figure, and followeth not as in other* Tables *by* Deſcent *but* Collateral.

EXAMPLE.

What is *Eaſter-Day* for 1757?

The Golden Number is 10, and the Dominical Letter is B.

Look among the Golden Numbers for 10, then guide your Finger along the ſame Line till you come under B, and there is *April* 10, which ſhews that to be *Eaſter-Day*.

9. Of ADVENT SUNDAY.

To find *Advent Sunday* for ever.

RULE.

Find the Dominical Letter for the given Year, and againſt it ſtands the Day of the Month, which is *Advent Sunday*.

A	*December*	3
B	*November*	27
C		28
D		29
E		30
F	*December*	1
G		2

EXAMPLE.

What is *Advent Sunday* for the Year 1764?

The Dominical Letter is G, therefore *Advent Sunday* is on *December* 2.

Note, Advent Sunday *never falls before* November 27, *nor after* December 3, *and is always the neareſt* Sunday *to the Feaſt of St.* Andrew, *whether before or after it.*

A TABLE

The Conſtruction of this Table.

1. Find *Eaſter-Day* by the foregoing Rules; which ſuppoſe to be *March* 22.

2. *Septuageſima Sunday*, being nine Weeks before *Eaſter*, reckon nine Weeks backward, in the Calendar, from *Eaſter-Day*; and if it be a common Year, *Septuageſima Sunday* will fall on *January* 18, but if it be a Leap Year, then on *January* 19.

3. The *Epiphany* is the 6th Day of *January*; then reckon backward from *Septuageſima* to the *Epiphany*, and you will find that there can be but one *Sunday* after the *Epiphany*.

4. *Aſh-Wedneſday* is 46 Days before *Eaſter-Day*; then reckon 46 Days backward from *Eaſter*, and *Aſh-Wedneſday* will be on *February* 4, in a common Year, but in a Leap Year on *February* 5.

5. *Aſcenſion-Day* is 40 Days after *Eaſter*, including *Eaſter-Day*; then begin at *Eaſter-Day*, and reckon forward 40 Days, and *Aſcenſion-Day* will be on *April* 30.

6. *Whitſunday* is 7 Weeks after *Eaſter*; then if you reckon forward from *Eaſter* 7 Weeks, *Whitſunday* will be *May* 10.

7. *Trinity Sunday* is 8 Weeks after *Eaſter*, or it is the *Sunday* next after *Whitſunday*.

8. *Advent Sunday* is always known by the Dominical, as before mentioned, which in this Caſe is *November* 29.

9. The Number of *Sundays* between *Trinity Sunday* and *Advent Sunday*, are the *Sundays* after *Trinity*, which here are 27, the greateſt Number that can be. After the ſame manner is the reſt of the Table calculated.

Its Uſe.

1. Find *Eaſter-Day* as before taught.

2. Look for *Eaſter-Day* in the Table, and on the ſame Line, either before or after it, ſtands the Holyday ſought for.

EXAMPLE.

I demand all the movable Holydays for the Year 1764?

1. *Eaſter-Day* for that Year is *April* 22.

2. Look for *April* 22 in the Column of *Eaſter-Day*, and on the ſame Line you will find,

6 *Sundays* after *Epiphany* in that Year.
February 19 to be *Septuageſima Sunday*.
March 7 to be *Aſh-Wedneſday*.
May 31 to be *Aſcenſion-Day*.
June 10 to be *Whitſunday*.
23 *Sundays* after *Trinity* in that Year; and
December 2 to be *Advent Sunday*.

A TABLE

A TABLE of the GOLDEN NUMBERS, EPACTS, SUNDAY LETTERS, and MOVEABLE FEASTS, calculated for Fifty Years.

Year of our Lord.	*Golden Number*	*Epact.*	*Sunday Letter.*	*Sundays after Epiphany*	*Septuagesima Sunday.*	*The first Day of Lent.*	*Easter-Day.*	*Rogation Sunday.*	*Ascension-Day.*	*Whit-Sunday.*	*Sundays after Trinity.*	*Advent Sunday.*
1752	5											Dec. 3
1753	6	25	G	6	Feb. 18	Mar. 7	Apr. 22	May 27	May 31	June 10	23	2
1754	7	6	F E	4	10	Feb. 27	14	19	23	2	24	1
1755	8	17	E	2	Jan. 26	12	Mar. 30	4	8	May 18	26	Nov. 30
1756	9	28	D C	5	Feb. 15	Mar. 3	Apr. 18	23	27	June 6	23	28
1757	10	9	B	4	6	Feb. 23	10	15	19	May 29	24	27
1758	11	20	A	2	Jan. 22	8	Mar. 26	Apr. 30	4	14	27	Dec. 3
1759	12	1	G	5	Feb. 11	28	Apr. 15	May 20	24	June 3	24	2
1760	13	12	F E	3	3	20	6	11	15	May 25	25	Nov. 30
1761	14	23	D	1	Jan. 18	4	Mar. 22	Apr. 26	Apr. 30	10	27	29
1762	15	4	C	4	Feb. 7	24	Apr. 11	May 16	May 20	30	24	28
1763	16	15	B	3	Jan. 30	16	3	8	12	22	25	27
1764	17	26	A G	6	Feb. 19	Mar. 7	22	27	31	June 10	23	Dec. 2
1765	18	7	F	3	3	Feb. 20	7	12	16	May 26	25	1
1766	19	18	E	2	Jan. 26	12	Mar. 30	4	8	18	26	Nov. 30
1767	1	0	E D	5	Feb. 15	Mar. 4	Apr. 19	24	28	June 7	23	29
1768	2	11	C B	3	Jan. 31	Feb. 17	3	8	12	May 22	25	27
1769	3	22	A	2	22	8	Mar. 26	Apr. 30	4	14	27	Dec. 3
1770	4	3	G	5	Feb. 11	28	Apr. 15	May 20	24	June 3	24	2
1771	5	14	F	2	Jan. 27	13	Mar. 31	5	9	May 19	26	1
1772	6	25	E D	5	Feb. 16	Mar. 4	Apr. 19	24	28	June 7	23	Nov. 29
1773	7	6	C	4	7	Feb. 24	11	16	20	May 30	24	28
1774	8	17	B	3	Jan. 30	16	3	8	12	22	25	27
1775	9	28	A	5	Feb. 12	Mar. 1	16	21	25	June 4	24	Dec. 3
1776	10	9	G F	4	4	Feb. 21	7	12	16	May 26	25	1
1777	11	20	E	2	Jan. 26	12	Mar. 30	4	8	18	26	Nov. 30
1778	12	1	D	5	Feb. 15	Mar. 4	Apr. 19	24	28	June 7	23	29
1779	13	12	C	3	Jan. 31	Feb. 17	4	9	13	May 23	25	28
1780	14	23	B A	2	23	9	Mar. 26	Apr. 30	4	14	27	Dec. 3
1781	15	4	G	5	Feb. 11	28	Apr. 15	May 20	24	June 3	24	2
1782	16	15	F	2	Jan. 27	13	Mar. 31	5	9	May 19	26	1
1783	17	26	E	5	Feb. 16	Mar. 5	Apr. 20	25	29	June 8	23	Nov. 30
1784	18	7	D C	4	8	Feb. 25	11	26	20	May 30	24	28
1785	19	18	B	2	Jan. 23	9	Mar. 27	1	5	15	26	27
1786	1	0	A	5	Feb. 12	Mar. 1	Apr. 16	21	25	June 4	24	Dec. 3
1787	2	11	G	4	4	Feb. 21	8	13	17	May 27	25	2
1788	3	22	F E	1	Jan. 20	6	Mar. 23	Apr. 27	1	11	27	Nov. 30
1789	4	3	D	4	Feb. 8	25	Apr. 12	May 17	21	31	24	29
1790	5	14	C	3	Jan. 31	17	4	9	13	23	25	28
1791	6	25	B	6	Feb. 20	Mar. 9	24	29	June 2	June 12	22	27
1792	7	6	A G	4	5	Feb. 22	8	13	May 17	May 27	25	Dec. 2
1793	8	17	F	2	Jan. 27	13	Mar. 31	5	9	19	26	1
1794	9	28	E	5	Feb. 16	Mar. 5	Apr. 20	25	29	June 8	23	Nov. 30
1795	10	9	D	3	1	Feb. 18	5	10	14	May 24	25	29
1796	11	20	C B	2	Jan. 24	10	Mar. 27	1	5	15	26	27
1797	12	1	A	5	Feb. 12	Mar. 1	Apr. 16	21	25	June 4	24	Dec. 3
1798	13	12	G	4	4	Feb. 21	8	13	17	May 27	25	2
1799	14	23	F	1	Jan. 20	6	Mar. 24	Apr. 28	2	12	27	1
1800	15	4	E	4	Feb. 9	26	Apr. 13	May 18	22	June 1	24	Nov. 30
1801	16	15	D	3	1	18	5	10	14	May 24	23	29

N. B. 1. *The Method of calculating this Table is the same with that of the preceding one, and its Use obvious.*

2. *The Year* 1800 *is not a Leap Year, because the Number of Hundreds are not divisible by* 4 *without a Remainder, and for that Reason has not two Letters annexed to it.*

3. *The several Omissions or Blanks standing against the Year* 1752, *denote, that when those respective Days, according to their* Titles, *happened in that* Year, *they were reckoned according to* Old Stile: *And as they were all pass'd before the* New Calendar *took Date*; that *is the Reason why they are omitted.*

Let this Table front p. 108.

A general TABLE for finding the DOMINICAL or SUNDAY LETTER.

6	5	4	3	2	1	0
B	C	D	E	F	G	A
				1600	1700	1800
1900 2000	2100	2200	2300 2400	2500	2600	2700 2800
2900	3000	3100 3200	3300	3400	3500 3600	3700
3800	3900 4000	4100	4200	4300 4400	4500	4600
4700 4800	4900	5000	5100 5200	5300	5400	5500 5600
5700	5800	5900 6000	6100	6200	6300 6400	6500
6600	6700 6800	6900	7000	7100 7200	7300	7400
7500 7600	7700	7800	7900 8000	8100	8200	8300 8400
8500	&c.					

The Uſe of the foregoing Table.

To find the Dominical or *Sunday* Letter for any given Year of our Lord, add to the Year its fourth Part, omitting Fractions, and alſo the Number, which ſtandeth at the Top of the Column, wherein the Number of Hundreds contained in that given Year is found: Divide the Sum by 7, and if there is no Remainder, then A is the *Sunday* Letter; but if any Number remaineth, then the Letter, which ſtandeth under that Number, at the Top of the Table, is the *Sunday* Letter. *See the Act of Parliament for correcting the Calendar.*

EXAM-

EXAMPLE.

What is the Dominical Letter for the Year 1764?

	4)1764	
Its fourth Part is –	441	
Add – – – – –	1	*which ſtands againſt the Number of Hundreds, viz.* 17 *Hundred.*
	7)2206	
	315	1 *remains, which ſhews the Letter to be* G.

General TABLES for finding the Places of the GOLDEN NUMBERS in the CALENDAR.

TABLE I.

1	2	3	1	2	3	1	2	3	1	2	3
	Years of our Lord.			*Years of our Lord.*			*Years of our Lord.*			*Years of our Lord.*	
B	1600	0		3400	8	B	5200	15		7000	24
	1700	1		3500	9		5300	16		7100	24
	1800	1	B	3600	8		5400	17	B	7200	24
	1900	2		3700	9		5500	17		7300	25
B	2000	2		3800	10	B	5600	17		7400	25
	2100	2		3900	10		5700	18		7500	26
	2200	3	B	4000	10		5800	18	B	7600	26
	2300	4		4100	11		5900	19		7700	26
B	2400	3		4200	12	B	6000	19		7800	27
	2500	4		4300	12		6100	19		7900	28
	2600	5	B	4400	12		6200	20	B	8000	27
	2700	5		4500	13		6300	21		8100	28
B	2800	5		4600	13	B	6400	20		8200	29
	2900	6		4700	14		6500	21		8300	29
	3000	6	B	4800	14		6600	22	B	8400	29
	3100	7		4900	14		6700	23		8500	0
B	3200	7		5000	15	B	6800	22		&c.	
	3300	7		5100	16		6900	23			

Note, *The Letter* B *prefixed to certain Hundredth Years, diviſible by* 4, *without any Remainder, denotes thoſe Years, which are ſtill to be accounted* Biſſextile *or* Leap Years, *in the* New Calendar; *whereas all the other Hundredth Years are to be accounted only* common Years.

TABLE

TABLE II.

Paschal Full Moon.	*Sunday Letter.*	The GOLDEN NUMBERS.																		
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX
Mar. 21	C	8	19	0	11	22	3	14	25	6	17	28	9	20	1	12	23	4	15	26
22	D	9	20	1	12	23	4	15	26	7	18	29	10	21	2	13	24	5	16	27
23	E	10	21	2	13	24	5	16	27	8	19	0	11	22	3	14	25	6	17	28
24	F	11	22	3	14	25	6	17	28	9	20	1	12	23	4	15	26	7	18	29
25	G	12	23	4	15	26	7	18	29	10	21	2	13	24	5	16	27	8	19	0
26	A	13	24	5	16	27	8	19	0	11	22	3	14	25	6	17	28	9	20	1
27	B	14	25	6	17	28	9	20	1	12	23	4	15	26	7	18	29	10	21	2
28	C	15	26	7	18	29	10	21	2	13	24	5	16	27	8	19	0	11	22	3
29	D	16	27	8	19	0	11	22	3	14	25	6	17	28	9	20	1	12	23	4
30	E	17	28	9	20	1	12	23	4	15	26	7	18	29	10	21	2	13	24	5
31	F	18	29	10	21	2	13	24	5	16	27	8	19	0	11	22	3	14	25	6
April 1	G	19	0	11	22	3	14	25	6	17	28	9	20	1	12	23	4	15	26	7
2	A	20	1	12	23	4	15	26	7	18	29	10	21	2	13	24	5	16	27	8
3	B	21	2	13	24	5	16	27	8	19	0	11	22	3	14	25	6	17	28	9
4	C	22	3	14	25	6	17	28	9	20	1	12	23	4	15	26	7	18	29	10
5	D	23	4	15	26	7	18	29	10	21	2	13	24	5	16	27	8	19	0	11
6	E	24	5	16	27	8	19	0	11	22	3	14	25	6	17	28	9	20	1	12
7	F	25	6	17	28	9	20	1	12	23	4	15	26	7	18	29	10	21	2	13
8	G	26	7	18	29	10	21	2	13	24	5	16	27	8	19	0	11	22	3	14
9	A	27	8	19	0	11	22	3	14	25	6	17	28	9	20	1	12	23	4	15
10	B	28	9	20	1	12	23	4	15	26	7	18	29	10	21	2	13	24	5	16
11	C	29	10	21	2	13	24	5	16	27	8	19	0	11	22	3	14	25	6	17
12	D	0	11	22	3	14	25	6	17	28	9	20	1	12	23	4	15	26	7	18
13	E	1	12	23	4	15	26	7	18	29	10	21	2	13	24	5	16	27	8	19
14	F	2	13	24	5	16	27	8	19	0	11	22	3	14	25	6	17	28	9	20
15	G	3	14	25	6	17	28	9	20	1	12	23	4	15	26	7	18	29	10	21
16	A	4	15	26	7	18	29	10	21	2	13	24	5	16	27	8	19	0	11	22
17	B	5	16	27	8	19	0	11	22	3	14	25	6	17	28	9	20	1	12	23
17	B												7	18	29	10	21	2	13	24
18	C	6	17	28	9	20	1	12	23	4	15	26								
18	C	7	18	29	10	21	2	13	24	5	16	27	8	19	0	11	22	3	14	25

Let this Table front p. 110.

The Uſe of the foregoing two Tables.

To find the Month and Days of the Month, to which the Golden Numbers ought to be prefixed in the Calendar, in any given Year of our Lord, conſiſting of entire Hundred Years, and in all the intermediate Years, betwixt that and the next Hundredth Year following, look in the ſecond Column of Table I for the given Year, conſiſting of entire Hundreds, and note the Number or Cypher which ſtands againſt it in the third Column; then in Table II, look for the ſame Number in the Column under any given Golden Number, which when you have found, guide your Eye Side-ways to the Left Hand, and in the firſt Column you will find the Month and Day to which that Golden Number ought to be prefixed in the Calendar, during that Period of one Hundred Years.

EXAMPLE.

1. It appears by Table I, that the Year 1700 has the Number 1 ſtanding againſt it, by which it is to be underſtood, that all the intermediate Years, between that and the Year 1800, have the ſame Number 1 belonging to them.

2. Begin with the Golden Number 1. in Table II. and look down that Column for the Number of the Year, *viz.* 1, againſt which, on the Left Hand, ſtands *April* 13.

3. Look down the Column, under the Golden Number 2, for the ſame Number 1, and you will find it againſt *April* 2.

4. Look down the Column, under the Golden Number 3, for the ſame Number 1, and you will find it ſtand againſt *March* 22, *&c.* and thus you have another Way of making the Table for the Paſchal Full Moons, as in the Table of the Golden Numbers, *&c.* p. 102 and conſequently of placing them againſt the ſeveral Days from *March* 22, to *April* 18 inclufive, as in the Table to find *Eaſter-Day* till the Year 1899, p. 103.

Of the NEW MOON, and the MOON's AGE.

DEFINITION.

THE New Moon is the Conjunction of the Sun and Moon under the ſame Degree of the ſame Sign of the Zodiac: And from that Time to the full her Light increaſeth, and ſhe is on the Eaſt Side of the Sun, and ſetteth after him. The Full Moon is the Oppoſition of the Sun and Moon, which happens

happens when they are in the ſame Degree of Signs diametrically oppoſite, and from that Time to the New Moon, her Light decreaſeth, and ſhe is on the Weſt Side of the Sun, and ſitteth before him.

Note 1, *From the Conjunction of the Sun and Moon oftentimes proceeds an Eclipſe of the Sun: For the New Moon is nothing elſe but her Interpoſition, or coming between the Sun and the* Earth, *and then her enlightened Part is turned from the Earth toward the* Sun; *and when all three happen in a right Line, then the Moon hides the Light of the Sun, or Part of its Light from the Earth, and this is an Eclipſe of the Sun.*

2. *From the Oppoſition of the Sun and Moon, oftentimes proceeds an Eclipſe of the Moon: For the Full Moon is nothing elſe but the Interpoſition of the Earth between the Moon and the Sun, and then the Moon hath all her enlightened Part turned towards the Earth, and when all three happen in a right Line, the Shadow of the Earth falls upon the Moon, and depriveth her either of her whole Light, or elſe of Part of her Light, and this is called an Eclipſe of the Moon.*

3. *When Part only of the Sun or Moon is eclipſed, ſuch an Eclipſe is ſaid to be partial; but when the whole of either of them is eclipſed, that Eclipſe is called Total.*

RULE.

Janus 0, 2, 1, 2, 3, 4, 5, 6,
8, 8, 10, 10, theſe to the Epact fix:
The Sum, 'bate 30, to the Month Day add,
Or take from 30, Age or Change is had.

Explanation. Every Month has one of the foregoing Numbers belonging to it; as,

Jan.

Jan. 0, *Feb.* 2, *Mar.* 1, *Apr.* 2, *May* 3, *June* 4, *July* 5, *Aug.* 6, *Sept.* 8, *Oct.* 8, *Nov.* 10, *Dec.* 10, Therefore

1. To the *Epact* add the Day of the Month, and the Number of the Month: The Sum, if it exceeds not 30, is her Age, if it be more than 30, ſubtract 30 from it, and the Remainder is her Age.

2. To the *Epact* add the Number of the Month, and ſubtract that Sum from 30, the Remainder is the New Moon: But if that Sum exceed 30, ſubtract it from 60, and the Remainder is the New Moon. Add 15 to the New Moon, ſhews the Day of the next Full Moon. Or,

If the New Moon happens on any Day of the Month above the 14th, ſubtract 15 from it, ſhews the laſt Full Moon.

Note, *The Numbers of the Months ariſe from the Moon's Age, on the firſt Day of each Month, when the Solar and Lunar Years begin together, and are called* Monthly Epacts.

EXAMPLES.

1. What is the Moon's Age *February* 18, 1764?

Epact - -	26
Number - -	2
Day - - -	18
	46
Subtract - -	30
	16 *Days old.*

Note, *When the Age of the Moon exceeds the Day of the Month, it ſhews that the laſt New Moon happened in the Month next preceding.*

2. On what Day in *February* 1764, will there be a New Moon?

Epact - -	26	30
Number - -	2	28
	28	2*d Day of* February.

Note, *If to the Day of the Month you add what the Moon's Age wants of* 30, *that Sum will be the next New Moon.*

Ex. In

Ex. In *February* 18, 1764, the Moon was 16 Days old, when will be the next New Moon?

30
16 *Moon's Age.*

14
18

32
Subtract 30

2*d Day of* March.

What Days will the New and Full Moon happen on in *April*, 1764?

Epact -	26	30
Number -	2	28
	28	*New Moon* 2*d Day of* April.
		15
		Full Moon 17*th Day of* April.

Note, This Way of finding the New and Full Moons, is not exactly true; but as it ſeldom differs above Half a Day from the true Conjunction, or Oppoſition, it is ſufficient for common Uſe.

Of the MOON'S SOUTHING.

DEFINITION.

WHEN the *Moon* comes to the great Meridian, or Twelve o'Clock Hour Line of any Place, ſhe is then due South, with Reſpect to that Place: And this is called the *Moon's Southing*.

The Time of the New Moon's *Southing* is Twelve at Noon; and from the New to the Full *Moon*, the Southing is after Noon, that is, ſome time between Noon and Midnight, but every Day 48 Minutes later than the former.

The Time of the Full Moon's *Southing* is Twelve at Midnight; and from the Full to the New Moon, the *Southing* is in the Morning, that is, ſome time between Midnight and the Noon next following, but every Day 48 Minutes later, as before.

RULE.

RULE.

Multiply the Moon's Age by 12, and divide that Product by 15, the Quotient gives Hours: If any thing remains, multiply it by 60, and divide again by 15, the Quotient gives Minutes.

EXAMPLES.

1. What is the Moon's Southing for *February* 8, 1764?

Moon's Age 6 *Days*

12

15)72(4 *Hrs.*
60

12
60

15)720(48 *Min.*
60

120
120

0

Answ. 4 *hrs.* 48 *min.* *Afternoon.*

2. What is the Moon's Southing for *February* 18, 1764?

Moon's Age 16 *Days*

12

15)192(12 *Hrs.*
15

42
30

12
60

15)720(48 *Min.*
60

120
120

0

Answ. 48 *Min. after Midnight.*

Note 1, *The common Day is from* Midnight *to* Midnight; *but the Aſtronomical Day is from* Noon *to* Noon; *and always begins* 12 *Hours ſooner than the common Day.*

2. *If the* Southing *is leſs than* 12 *Hours, it is the Time of the Southing in the Afternoon of the given common Day, as in the firſt Example.*

3. *If the* Southing *is more than* 12 *Hours, it is ſo much after the Noon of the given common Day, from which if* 12 *be ſubtracted, the Remainder is the Morning next following, as in the ſecond Example.*

4. *Becauſe the Moon moves* 12° *every Day more than the Sun, therefore the Lunar Days, or Moon's Age, are multiplied by* 12, *to ſhew the whole Number of Degrees ſhe moves more than the Sun, during her given Age: Then becauſe* 15° *make an Hour of Time, therefore thoſe Degrees are divided by* 15, *to ſhew the Number of Hours: The Remainder, if any, being ſo many Fifteenths of an Hour, is multiplied by* 60, *and divided again by* 15, *to ſhew the Minutes. All which is thus ſhortened.*

RULE.

Multiply the Moon's Age by 4, and that Product divide by 5, the Quotient is Hours, and the Remainder, ſo many times 12 Minutes. Or,

Multiply the Moon's Age by 0.8 becauſe 4 divided by 5, is = 0.8 the whole Number is the Product in Hours, and the Decimal ſo many times 6 Minutes.

EXAMPLE.

What is the Moon's Southing for *February* 18, 1764?

Moon's Age 16 *Days*
4

5)64(12 *Hrs.*
4
12

48 *Min.*

Or thus.
Moon's Age 16 *Days*
.8

Hrs. 12.8
6

Min. 48

A TABLE

A TABLE ſhewing the Time of the Moon's coming to the South, any Day of her Age.

Moon's Age.		Moon's Southing.	
Days.		H.	M.
1	16	0	48
2	17	1	46
3	18	2	24
4	19	3	12
5	20	4	0
6	21	4	48
7	22	5	36
8	23	6	24
9	24	7	12
10	25	8	0
11	26	8	48
12	27	9	36
13	28	10	24
14	29	11	12
15	30	12	0

Moon's Increaſe. Moon's Decreaſe.

The Conſtruction of this Table.

This is no more than a continual Addition of 48 Minutes of Time (the common Difference between every Day's Southing) to every Southing, which produces the Hours and Minutes.

The Days are ſet double, or in two Columns, becauſe the ſame Time anſwers to both, only with this Difference, that during the Moon's *Increaſe*, the Time is in the Afternoon; and during the *Decreaſe*, it is in the Morning.

The Uſe of the Table.

It was ſhewed before, that the New Moon ſouths at Noon, and the Full Moon at Midnight. Now if it be required to know when the Moon ſouths the firſt Day after the New Moon; the Anſwer is, by the Table 0*h*. 48*m*. that is, 48 Minutes after 12 at Noon: If the Southing be required on the 16th Day, which is one Day paſt the Full; the Anſwer is 48 Minutes paſt 12 at Midnight, or in the Morning, *&c.*

To find the Time of High Water at any Port in GREAT BRITAIN.

RULE.

To the Moon's Southing add the Time of High Water at the given Port on the Full and Change Days, and the Sum is the Time of High Water at that Port.

A TABLE

A TABLE of the Time of High Water on the Full and Change Days, at the ſeveral Ports in *England*, and other Places elſewhere.

		H.	M.
Abbrevrak,	France	4	30
Aberdeen,	Scotland	0	45
Aldborough,	England	9	45
I. Alderney,	England	12	0
R. Amazons,	TerraFir	6	0
I. Ameyland,	Dutchld.	7	30
Amſterdam,	Dutchld.	3	0
St. Andrews,	Scotland	2	15
I. Anholt,	Denmk.	12	0
Antwerp,	Flanders	6	0
Archangel,	Ruſſia	6	0
Baltimore,	Ireland	4	30
C. Barfleur,	France	8	0
I. de Bas,	France	3	45
Bayonne,	France	3	30
Beachy Head,	England	12	0
Bell-Iſle,	France	1	30
I. Bermudas,	Baha. Is.	7	0
Berwick,	England	1	30
Blakeney,	England	6	0
C. Blanco,	Negrold.	9	45
BlanchartRace,	France	12	0
Blavet, *or* Port Louis	France	1	30
C. Bodajor,	Negrol.	12	0
Bourdeaux,	France	3	0
Boulogne,	France	10	30
Bremen,	Germany	6	0
Breeſound, a Sand	Dutchld.	4	30
Breſt,	France	3	45
Bridlington Bay	England	3	45
Briſtol,	England	6	45
Buchaneſs,	Scotland	3	0
Cadiz,	Spain	4	30
Caen,	France	9	0
Calais,	France	4	30
I. Caldy,	England	5	15
Camfer, a Sand,	Dutchld.	1	30
C. Cantin,	Barbary	12	0
Carthagena,	Spain	8	1
CathneſsPoint, or Dinnet Head	Scot.	9	0
Cherbourg,	France	7	0
C. Clear,	Ireland	4	30
Concarneau,	France	3	0
Conquet,	France	3	0
I. Coquet,	England	3	0
Cork,	Ireland	4	30
C. Corſe,	Guinea	3	30
Cromer,	England	6	0
Dartmouth,	England	5	15
St. David'sHd.	Wales	6	0
Diep,	France	9	45
Dort,	Dutchld.	8	0
Dover,	England	12	0
Downs,	England	2	15
Dublin,	Ireland	8	15
Dunbar,	Scotland	4	30
Dundee,	Scotland	2	15
Dungarvan,	Ireland	4	30
Dungeneſs,	England	9	45
Dunkirk,	France	12	0
Dunnoſe,	I. Wight	9	45
Edinburgh,	Scotland	4	30
Edyſtone,	England	7	30
R. Elbe'sMouth,	Germy.	12	0
Embden,	Germy.	12	0
R. Eme'sMouth	Germy.	7	30
Enchuyſen,	Dutchl.	12	0
Eſtaples,	France	11	0
Falmouth,	England	4	30
Flamborough Head	Engld.	3	0
C. Florida.	Florida	7	30

Fluſhing

		H.	M.
Flushing,	Dutchld.	0	45
I. Fly,	Dutchld.	7	30
N. Foreland, S. Foreland	England	9	45
Foulness,	England	6	45
Foye,	England	5	15
R. Garronne,	France	3	0
Gibralter,	Spain	12	0
Granville,	France	7	0
Graveline,	France	12	0
Gravesend,	England	1	30
Groin *or* C. Corunna	Spain	3	0
I. Guernsey,	England	0	45
Hamburgh,	Germy.	6	0
Harlem,	Dutchld.	9	0
Hartlepool,	England	3	0
Harwich,	England	11	15
Havre deGrace,	France	9	0
C. Good Hope,	Caffreria	3	0
Hull,	England	6	0
R. Humber's Mouth,	England	4	30
St. John deLuz,	France	3	30
I. Kildain,	France	7	30
Kinsale,	Ireland	4	30
Land's End,	England	7	30
I. Lambay,	Ireland	8	15
Leith,	Scotland	4	30
Leostoff,	England	9	45
Lisbon,	Portugal	2	15
Lizard,	England	7	30
R. Loire,	France	3	0
London,	England	3	0
I. Lundy,	England	5	15
Lynn,	England	6	0
St. Maloes,	France	6	0
I. Man, W. End,	England	9	0
Margate,	England	11	15
Memisan,	France	3	30
Milford,	Wales	5	15
Mounts Bay,	England	4	30
Nantes,	France	3	0

		H.	M.
Naze,	Norway	11	15
Needles,	England	9	45
Newcastle,	England	5	15
Nieuport,	Flanders	12	0
Nore,	England	12	0
North Cape,	Lapland	3	0
Ollone,	France	3	45
Orfordness,	England	9	45
Orkney Isles Limits	Scotland	3	0
Ostend,	Flanders	12	0
St. Paul deLeon,	France	4	0
Plymouth,	England	6	0
Portland,	England	12	0
Quebec,	Canada	6	0
I. Ree,	France	3	0
RobinHood's Bay	England	3	0
Rochelle,	France	3	45
Rochester,	England	0	45
Rotterdam,	Dutchld.	3	0
Rouen,	France	3	45
Rye,	England	11	15
Scarborough Head	England	3	45
Scilly Isles,	England	3	45
R. Senegal,	Negrod.	10	30
Seven Stones,	England	4	30
R. Severn Ent.	England	4	30
R. Seyne Ent.	France	10	30
Sheerness,	England	1	0
I. Shetland Limits	Scotland	3	0
Shoreham,	England	9	45
Southampton - - -		12	0
Spurn - - - - -		5	15
Start Point - - - -		6	45
Stockton - - - -		5	15
R. Tee's Mouth - -		3	0
Tinmouth - - - -		3	0
Torbay - - - -		5	15
Waterford,	Ireland	4	30
Wells,	England	6	0

Weymouth

	H.	M.		H.	M.
Weymouth, England	6	0	Wintertonneſs	9	0
Whitby	3	0	Yarmouth	9	45
I. Wight E. End	12	0	Youghall, Ireland	4	30
Winchelſea	0	45			

OBSERVATIONS concerning the Ebbing and Flowing of the Tide, at and near *London*.

1. BElow-Bridge the Water ebbs ſeven Hours, and flows five Hours, *i. e.* it is ſeven Hours going down, and five Hours going up.

2. Above-Bridge, the Water ebbs eight Hours, and flows four Hours, *i. e.* it is eight Hours going down, and but four Hours going up.

3. When the Water is at the loweſt, then it is called low Water.

4. When the Water begins to riſe, it is called *young Flood*: And when it is almoſt at the higheſt, then it is called *old Flood*.

5. When the Water is quite at the higheſt, it is called *high Water*.

6. When the Water begins to fall, it is then paſt high Water, and is called *Ebb Water*.

7. The Falling and Riſing of the Water, is the Ebbing and Flowing of the Tide.

EXAMPLE.

1. What Time will it be high Water at *London*, *February* 18, 1764?

	H.	M.	
Moon's Southing	0	48	*in the Morning*
Add	3	0	
**High Water at*	3	48	*in the Morning*

* Note, *This is too late; and as a Miſtake may happen by making the Moon a Day older than ſhe really is; it will alſo occaſion a Miſtake in her Southing. The Time of High Water at* London-Bridge, *on the Full and Change Days, has always been ſaid to be at Three; but whoever will make the Obſervation, will find that Hour too late alſo. Hence this Method of finding the Time of* High Water *is not to be depended on for Exactneſs.*

2. What

2. What Time will it be high Water at *Rocheſter*, *February* 18, 1764? *Anſw.* 1 *h.* 33 *m.* *in the Morning.*

3. What Time will it be high Water at *Graveſend*, *February* 18, 1764? *Anſw.* 2 *h.* 18 *m.* *in the Morning.*

To find the HOUR of the NIGHT by the MOON on a SUN-DIAL.

RULE.

1. FIND the Moon's Southing for the given Day.

2. If the Shadow happens before the Hour of 12, ſubtract the Time that it wants of 12, from the Southing: Or,

3. If the Shadow happens after the Hour of 12, add the Time that it makes after 12, to the Southing, and the Difference, or Sum, will be the Hour of the Night required.

EXAMPLES.

1. I demand the Hour of the Night, when the Shadow falls on the 11th Hour, *February* 18, 1764?

	H.	*M.*	
Moon's Southing	12	48	
Subtract – –	1	0	
Anſwer – – –	11	48	*at Night.*

2. I demand the Hour of the Night when the Shadow falls ¾ after 2 on the aboveſaid Night? *Anſw.* 3 *h.* 33 *min.* *in the Morning.*

3. I demand the Hour of the Night, when the Shadow falls on the 12th Hour? *Anſw.* 12 *h.* 48 *m.* *equal to the Southing.*

RULES to judge of the Weather by the BAROMETER.

1. THE riſing of the *Mercury* preſages, in general, fair, and its falling, foul Weather.

2. In very hot Weather, the falling of the *Mercury* foreſhews Thunder.

3. In Winter the riſing preſages Froſt: But in a continued Froſt it preſages Snow.

4. When foul Weather happens ſoon after the falling of the *Mercury*, expect but little of it; and ſo on the contrary of fair Weather.

5. When the *Mercury* continues to riſe for ſome Time before the foul Weather is over, expect a Continuance of fair Weather to follow.

6. In fair Weather when the *Mercury* continues to fall before Rain comes, you may expect a great deal of Wet; and probably high Winds.

7. The unſettled Motion of the *Mercury* denotes uncertain and changeable Weather.

8. It has been found, by long Experience, that in theſe Northern Parts of the World, the riſing of the *Mercury* forebodes fair Weather after foul, and alſo after Eaſterly or Northerly Winds; and that the falling thereof, on the contrary, ſignifies Southerly or Weſterly Winds, or both. And in a Storm, it has been experienced, in high Latitudes, that when the *Mercury* begins to riſe, it is a ſure Sign that the Storm then begins to abate; and this both to the Northward and Southward of the Equator.

Miſcellaneous Arithmetic:

OR A FULL

ACCOUNT of the NEW CALENDAR, &c.

PART IV.

Of LOGARITHMETIC.

LOGARITHMS are artificial Numbers, made to correſpond with natural Numbers, in ſuch Manner, that the Addition of the former does exactly anſwer to the Multiplication of the latter, and the Subtraction of the former to the Diviſion of the latter.

The Indices of all *Logarithms* are the principal *Logarithms* anſwering to their correſpondent prime Numbers; and ſhew the Diſtance of the natural Numbers from the Units Place. Thus,

Prime Numbers.	*Logarithms.*
1 - - - - - - -	0.0000000
10 - - - - - - -	1.0000000
100 - - - - - - -	2.0000000
1000 - - - - - - -	3.0000000
10000 - - - - - - -	4.0000000

Hence it appears, that if a natural Number has but one Figure, the Index of its correſpondent *Logarithm* is 0: If it has two Figures, the Index is 1; If it has three Figures, the Index is 2; &c. Alſo,

If 0 is the *Logarithm* of 1, and 1 is the *Logarithm* of 10, then all the *Logarithms* belonging to the natural Numbers between 1 and 10, are Decimals leſs than 1. Again,

If 1 is the *Logarithm* of 10, and 2 is the *Logarithm* of 100, then all the Logarithms belonging to the natural Numbers between 10 and 100, are a 1 with Decimal Parts annexed to it.

Indices are of two Kinds, *viz.* Affirmative and Negative. The Affirmative are thoſe which are appropriated to whole Numbers; but the Negative to Decimal Fractions and Defective *Logarithms*.

The Affirmative Indices need no Signs; but the Negative have always this Sign − prefixt to them, becauſe they are leſs than an Unit or 1.

All Numbers, whether Integers or Decimals, expreſſed by the ſame Figures, have the ſame *Logarithm*, except the Index, which is variable in Proportion to the Diſtance of the natural Number from Units Place. Thus,

Natural Numbers.	*Logarithms.*
7371.	3.8675264
737.1	2.8675264
73.71	1.8675264
7.371	0.8675264
.7371	−1.8675264
.07371	−2.8675264
.007371	−3.8675264
.0007371	−4.8675264

Note, *There is a Method of uſing the Complements of Negative Indices, inſtead of the true negative Indices, by taking them from* 10, *and then thoſe* Logarithms, *with their Indices, will ſtand thus,*

Nat. Numbers.	*Logarithms.*
.7371	−9.8675264
.07371	−8.8675264
.007371	−7.8675264
.0007371	−6.8675264

I ſhall uſe them both Ways for the Learners Improvement, as Occaſion requires.

ADDITION of INDICES.

Addition adds like Indices, but compares unlike.

RULE.

When two Indices unlike, are compared, keep the Mark of the greater Number in the Sum.

EXAMPLES.

Add	3	−3	3	−3	−10	−10	10	8	−8	9	9	−9	9	−9
	4	4	−4	−4	−10	10	−9	6	6	5	−5	−5	4	−4
	7	1	−1	−7										

Add

Add							1	3	4	7	4	
			1	4	-7	4	2	7	-3	-7	3	
	-7	-7	7	6	-6	-6	-6	-6	-5	-9	-6	
	2	-2	2	-2	-9	9	-9	6	7	4	9	-3

SUBDUCTION of INDICES.

Subduction compares like, and adds unlike Indices.

RULE.

In Subduction, always change the Nature of the lower Index, and then add them as in Addition.

Note 1, *From any given Number to subtract or take away another Number, is to add the Want of it.*

2. *From any given Number to subtract or take away the Want of another Number, is add that Number to it.*

EXAMPLES.

From	3	-3	3	-3	9	-9	9	-9	5	-5	5	-5	8	1	1
Take	2	2	-2	-2	5	5	-5	-5	9	9	-9	-9	-9	3	4
	1	-5	5	-1											

From	9	8	-8	8	6	-6	-6	1	6	3	-3	-5	-5	7
Take	-7	6	6	-6	8	8	-8	-5	-9	4	9	5	-6	6

From	5	6	7	2	4	-4	-4	4	7	6	5	-7	-6	-5
Take	-4	-9	2	7	-3	-3	3	3	-4	-3	-2	4	-2	3

To find the LOGARITHM of any given Number.

EXAMPLES.

1. What is the Logarithm of 72?

Enter the Table of Logarithms, and againſt 72 you have the Logarithm 1.857332 5

2. What is the Logarithm of 84?
3. What is the Logarithm of 176?
4. What is the Logarithm of 4768?

Note, *This* Number *having four Figures, you must look for the three first Figures,* viz. 476 *among the whole Numbers, as before, and for the last Figure,* viz. 8, *at the Top of the Page; then guiding your Finger across the Page from* 476, *till you come to the Column which hath* 8 *over it, in that Place is the Logarithm required,* viz. .6783362; *and as your whole Number consists of* 4 *Places; so the Index must be* 3, *and then the* Logarithm *will stand thus,* 3.6783362

5. What is the Logarithm of 6746?
6. What is the Logarithm of 4.8?

Note, *When the given Number is either a* Decimal *or a* Mixt Number, *the* Logarithm *for that Number is the same as if it were a whole Number, the* Index *only being variable, according to the Nature of the Number given, as in the Observation on* 7371 *aforegoing, p.* 124.

7. What is the Logarithm of .123? 264
8. What is the Logarithm of .4721?
9. What is the Logarithm of 4.121?
10. What is the Logarithm of 47.12?
11. What is the Logarithm of 312.7?

If the Number given exceeds the Limits of the Table of Logarithms, that is, if it consists of 5, 6 or more Places, then the Logarithm must be found by the following general

RULE.

1. Find the Logarithm of the first four Figures without its Index, as above.
2. Find the next greater Logarithm.
3. Find the Difference between those two Logarithms.
4. Multiply that Difference with the other Figure or Figures of the given Number.
5. Cut off so many Figures of that Product as you multiply by.
6. Add the remaining Figures of that Product to the Logarithm of the first four Figures.
7. To that Sum prefix the proper Index, and you will have the Logarithm required.

EXAM-

EXAMPLES.

12. What is the Logarithm of 39294?

The Logarithm next greater than that of 3929 *is*	.5943926
The Logarithm of 3929 *is*	.5942820
The Difference is	1106
Multiply by the laſt Figure	4
Cut off the laſt Figure	44214

The Remainder is 442, which is the Part proportional to be added to the Logarithm of 3929, thus

.5942820
442
.5943262

To which prefix the proper Index, and it makes 4.5943262, the true Logarithm.

13. What is the Logarithm of 37271256?

Next greater Logarithm than that of 3727 *is*	.5714759
The Logarithm of 3727 *is*	.5713594
Difference	1165
Multiply	1256
Product	1463240

.5713594
146
7.5713 1740 = *the Logarithm of* 37271256.

14. What is the Logarithm of 47684.?
15. What is the Logarithm of 3698.7?
16. What is the Logarithm of 1374.21?
17. What is the Logarithm of 9817.694?

To find the NUMBER to a given Logarithm.

EXAMPLES.

1. WHAT is the Number of this Logarithm 0.5331363?

Omit the Index, and ſeek among the Logarithms for the given Logarithm, againſt which ſtands 341, and over the given Logarithm, at the Top, is the Number 3, which ſhews the Number to be 3413. Then, becauſe the Index is 0, it imports the firſt Figure of that Number to be a whole Number, and the reſt Decimals; therefore the true Number is 3.413.

2. What is the Number of this Logarithm 0.5910646?
3. What is the Number of this Logarithm 1.8692317?
4. What is the Number of this Logarithm 2.3560259?
5. What is the Number of this Logarithm 3.5249151?

Note, *When you cannot find the exact* Logarithm *in the Table, and it appears by the* Index, *that the natural Number belonging to it is a* Decimal, *or a mixt* Number, *having but one or two Figures in the whole Number, you may take the neareſt* Logarithm *to the* Logarithm *given, whether greater or leſs, and that will be ſufficient; becauſe if the* natural Number *ſhould be increaſed to* 5, 6, *or more Places, they are ſtill but* Decimals *removed farther from the* Units *Place; as in the following*

EXAMPLES.

6. What is the Number of this Logarithm 0.5943218?

Look in the firſt Page of the Table of Logarithms, and you will find .5910646, which is too little, and .6020600, which is too much; ſo that you may conclude it ſhould be a Number between 3.9 and 4.0, in this Caſe turn to the greater Logarithms, and you will find .5942820, which is the neareſt Logarithm the Table can exhibit: Then for its correſpondent Number, againſt it ſtands 392, and over it, at the Top, ſtands the Figure 9, which ſhews the natural Number to be 3929: But becauſe the Index of the given Logarithm is 0, it imports the firſt Figure only to be a whole Number, and the reſt Decimals; and then the true Number is 3.929

7. What is the Number of this Logarithm 0.3126712?
8. What is the Number of this Logarithm 0.4867126?
9. What is the Number of this Logarithm 0.5712671?
10. What is the Number of this Logarithm 0.6438127?

But if the given Number, without its Index, cannot be exactly found in the Table, and the Index imports its natural Number to conſiſt of 5, 6 or more Places, that Number muſt be found by the following

RULE.

RULE.

1. Find the next leſs Logarithm to the Logarithm given, which is the Logarithm of the firſt four Figures of the Number required.

2. Subtract that Logarithm from the Logarithm given.

3. Annex ſo many Ciphers to the Remainder, as there are remaining Figures in the whole Number.

4. Divide this Number, with its annexed Cipher or Ciphers, by the Difference between thoſe two Logarithms, which are next greater and next leſs than the Logarithm given.

5. Annex the Quotient laſt found to the four Figures firſt found, and they will make the natural Number required.

EXAMPLES.

11. What is the natural Number of this Logarithm 4.5943262?

Here the Number ſought conſiſts of 5 Places, as appears by the Index 4.

The Logarithm given is - - - - - - - - -	·5943262
The next Logarithm (which is the Logarithm of the firſt four Figures ſought, viz. 3929) *is* - -	·5942820
The Difference is - - - - - - - - - - -	442

Annex one Cipher, becauſe there is but one Figure to find, and it makes 4420. Again,

The next greater Logarithm than the Logarithm given is - - - - - - - - - - - - -	·5943926
The next leſs Logarithm than the Logarithm given is - - - - - - - - - - - - - -	·5942820
Diff.	1106

Then 1106)4420(4 nearly.

Therefore finding the firſt four Figures to be 3929, annex the 4 laſt found, and it makes 39294, the Number required.

Note, *The Truth of this will beſt appear from Tables of large Numbers*; *as* Sherwin's.

12. What is the natural Number of this Logarithm 4.7623471?

13. What is the natural Number of this Logarithm 4.8712381?

14. What is the natural Number of this Logarithm 5.7123476?

To find the LOGARITHM of a VULGAR FRACTION.

RULE.

Subtract the Logarithm of the Denominator from the Logarithm of the Numerator, and the Remainder is the Logarithm of the Fraction desired.

EXAMPLES.

1. What is the Logarithm of $\frac{3}{4}$?

From	3	0.4771213
Take	4	0.6020600
Answer		-1.8750613

By Decimals.

1. 4)3.00(.75

2. The Logarithm of .75 is .8750613 to which if a Negative Index be prefixed, becauſe the Decimal .75 is but one Remove below Unity, it will ſtand thus -1.8750613

2. What is the Logarithm of $\frac{11}{13}$?

From	11	1.0413927
Take	13	1.1139434
Answer		-1.9274493

By Decimals.

1. 13)11.00000000(.84615384

2. *The Logarithm of* 8461 *is* - - - - - - .9274217
   The next greater Logarithm is - - - - - .9274730

   The Difference is - - - - - - - - - - 513

3. *Multiply the Difference by the four laſt Figures* 5384

   The Product is - - - - - - - - - - 2761992

4. *The Logarithm of* 8461, *as before, is* - - .9274217
   To which add - - - - - - - - - - 276

   The Sum is the Answer, as before - - - -1.9274493

Note,

Note 1, *Mr.* Chambers *in his* Cyclopædia, *printed in* 1750, *ſays*, To find the Logarithm of a Fraction: Subtract the Logarithm of the Numerator from the Logarithm of the Denominator; *and the Reaſon he aſſigns for it is this*, That a Fraction being the Quotient of the Denominator divided by the Numerator, its Logarithm muſt be the Difference of the Logarithms of thoſe two, *i. e.* the two given Numbers. *The Example is the Fraction* $\frac{3}{7}$, *which he thus works*,

Log. of 7 = 0.8450980
Log. of 3 = 0.4771213

Log. of $\frac{3}{7}$ = 0.3679767

But this is extremely wrong, for the Logarithm *of* $\frac{3}{7}$, *found as above, is, in Fact, the* Logarithm *of* $2\frac{1}{3}$ = 2.3333+ = *the* Logarithm 0.3679706. *Beſide; a Fraction, that is, a Decimal Fraction is not the Quotient of the* Denominator *divided by the* Numerator, *but the Quotient of the* Numerator *divided by the* Denominator. *Hence if (of* $\frac{3}{7}$*)* 7 *is divided by* 3, *the* Quotient *will be* 2.3333+ *as above, which is the Decimal of* $2\frac{1}{3}$; *but the* Quotient *of* 3 *divided by* 7 *is* .42857+ *which is the true* Decimal Fraction.

2. *I choſe to mention this, becauſe ſome having* Chambers's *Dictionary, may inſiſt that the Rule there laid down muſt be juſt, becauſe given by ſo great an Author; but it is certainly a very great Overſight; and the more ſo, becauſe given in Words at Length; and whoever lent the helping Hand in that (for it is certain Mr.* Chambers *did not do all) was ſo haſty in the Performance, that he took the Wrong for the Right, and ſo, Neck and Heels, it was brought into the Body of that Work, and paſſed for genuine.*

3. What is the Logarithm of $\frac{4}{5}$?
4. What is the Logarithm of $\frac{7}{12}$?
5. What is the Logarithm of $\frac{31}{47}$?
6. What is the Logarithm of $4\frac{7}{8}$?
7. What is the Logarithm of $19\frac{6}{9}$?
8. What is the Logarithm of $17\frac{1}{2}$ of $\frac{2}{3}$?

MULTIPLICATION by LOGARITHMS.

RULE.

Add the *Logarithms* of the given Numbers together, and their Sum will be the *Logarithm* of the Product of the given Factors, Regard being had to the true ordering of the Indices.

CASE I.

If the Indices are both affirmative, their Sum, with what ariſes from the Addition of the Logarithms, will be an affirmative Index.

EXAM-

EXAMPLES.

	Num.	Logarithms.	Num.	Logarithms.
Factors	36	1.5563025	3.6	
	12	1.0791812	1.2	
Product	432	2.6354837	4.32	0.6354837
Factors	46		7.4	
	72		14.1	
Product	3312	3.5200903	104.34	2.0184508
Factors	876.1		14.8	
	19.2		96.1	
Prod.	16821.12	4.2258549	1422.28	3.1529851

CASE 2.

If the Indices are both Negative, their Sum (notwithstanding what arises from the Addition of the *Logarithms*, which is always affirmative) will be a negative Index.

EXAMPLES.

	Num.	Logarithms.	Num.	Logarithms.
Factors	.76	-1.	.336	-1.
	.38	-1.	.228	-1.
Product	.2688	-1.4605972	.076608	-2.8842741
	.0347		.0000034	
	.0236		.0000023	
	.00081892	-4.9132415	.000000000000782	-12.8932068
Factors	.000047			
	.000016			
Product	.000000000752	-10.8762179		

This is exactly the same with its Complement in all Respects, as hereafter.

CASE

CASE 3.

When the Indices are one Affirmative, and the other Negative, their Sum, with what is carried from the Logarithms, will be either an affirmative or a negative Index, according to the Nature of the greater Figure or Index in the Factors.

EXAMPLES.

	Num.	*Logarithms.*	*Num.*	*Logarithms.*
Factors	738		34	
	.09		.0007	
Product	66.42	1.8222989	.0238	-2.3765769

Note, *If nothing ſhould be carried from the* Logarithms, *and their* Indices *be even, as in the firſt Example following; or if* 1 *being carried from the* Logarithms *to the* affirmative Index, *makes them even, as in the ſecond Example, in either Caſe the* Index *of their Sum will be* 0.

EXAMPLES.

	Num.	*Logarithms.*	*Num.*	*Logarithms.*
Factors	36	1.	25	1.
	.23	-1.	.076	-2.
Product	8.28	0.9180303	1.900	0.2787536

2. By the Complements of the NEGATIVE INDICES.

CASE 1.

One Index affirmative, and the other negative.

RULE.

If their Sum be 10, or above 10, then caſt off 10, and the Remainder will be an affirmative Index; but if their Sum be leſs than 10, it will be a negative Index.

EXAMPLES.

	Num.	*Logarithms.*	*Num.*	*Logarithms.*
Factors	75.64	1.8787515	756.4	
	.75	-9.8750613	.0075	
Product	56.73	1.7538128	5.673	0.7538128

Num.

	Num.	Logarithms.	Num.	Logarithms.
Factors	76.19		14.7	
	.217		.004	
Pro.	16.53323	1.2183577	.0588	-8.7693773
Factors	.0044		.00076	
	71.09		4.91	
Product	.312796	-9.4952612	.0037316	-7.5718951

CASE 2.

Both Indices Negative.

RULE.

1. If the Sum of the Indices be above 10, reject 10, and the Remainder will be a negative Index.

EXAMPLES.

	Num.	Logarithms.	Num	Logarithms.
Factors	.347	-9.5403295	.034	
	.236	-9.3729120	.023	
Product	.081892	-8.9132415	.000782	-6.8932067
Factors	.004		.007	
	.089		.009	
Product	.000356	-6.5514500	.000063	-5.7993405

2. If the Sum of the Indices be just 10, that Sum will be a negative Index.

EXAMPLES.

	Num.	Logarithms.	
Factors	.000047	-5.6720979	This is the same as that in Case 2, in the true negative Indices.
	.000016	-5.2041200	
Product	.000000000752	-10.8762179	
Factors	.00027		
	.000003		
Product	.000000000081	-10.9084851	

3. If

3. If the Sum of the Indices be under 10, add 10 to it, and the Sum will be a negative Index.

EXAMPLES.

	Num.	Logarithms.
Factors	.00000278	-4.4440448
	.00000176	-4.2455127
Product	.0000000c000048928	-18.6895575
Factors	.0000027	
	.0000076	
Product	.00000000002052	-19.3121774
Factors	.00000084	
	.00000091	
Product	.000000000000007644	-17.8833207

Note 1, *These two last Parts never come into common Practice, and but seldom in any other Shape.*

2. *The above* Indices *are the Complements of the true Indices taken from* 30.

DIVISION by LOGARITHMS.

RULE.

Subtract the *Logarithm* of the Divisor from the *Logarithm* of the Dividend, and the Remainder is the *Logarithm* of the Quotient.

Note 1, *When the Dividend is greater than the Divisor, the Index of the Quotient-Logarithm will be affirmative, though the Indices of the Logarithms of the given Numbers should be both* negative.

2. *When the Dividend is less than the Divisor, the Index of the Quotient-Logarithm will be negative.*

1. By Affirmative Indices.

EXAMPLES.

	Num.	Logarithms.	Num.	Logarithms.
Dividend	432		432	
Divisor	12		36	
Quotient	36	1.5563025	12	1.0791812

Dividend

	Num.	Logarithms.	Num.	Logarithms.
Dividend	3312		104.34	
Diviſor	72		7.4	
Quotient	46	1.6627578	14.1	1.1492191

2. By Negative Indices.

EXAMPLES.

	Num.	Logarithms.	Num.	Logarithms.
Dividend	.2888		.0588	
Diviſor	.38		.004	
Quotient	.76	-1.8808136	14.7	1.1673173
Dividend	.076608		.00081892	
Diviſor	.228		.0236	
Quotient	.336	$-1.\bar{5}263393$	.0347	-2.5403295

3. By the Complements of the Negative Indices.

Note 1, *There muſt be* 10 *added to the Index of the Logarithm of the Dividend, when Subtraction cannot be made without it.*

2. *When the Indices are both negative, and the Dividend the greater, then the leſs from the greater gives an* affirmative Index, *as in the* 2*d and* 3*d Examples.*

3. *When the Decimal is ſo ſmall as to make the* Index *of the correſpondent Logarithm above* 9, *then its Complement muſt be taken from* 20, *as in the laſt three Examples.*

EXAMPLES.

	Num.	Logarithms.	Num.	Logarithms.
Dividend	.0037316	-7.	.782	-9.
Diviſor	4.91	0.	.023	-8.
Quotient	.00076	-6.8808136	34.	1.5314789
Dividend	.0356	-8.	.000063	-5.
Diviſor	.0089	-7.	.009	-7.
Quotient	4.	0.6020600	.007	-7.8450980

Dividend

	Num.	*Logarithms.*
Dividend	.000000000752	−10.
Diviſor	.000016	−5.
Quotient	.000047	−5.6720979

Dividend	.00000000081	
Diviſor	.000003	
Quotient	.00027	−6.4313638

Dividend	.000000000048928	
Diviſor	.00000176	
Quotient	.00000278	−4.4440448

To ſquare a NUMBER by the LOGARITHMS.

RULE.

Multiply the Logarithm of the given Number by 2, the Product will be the Logarithm of the Square required.

1. By Affirmative Indices.

EXAMPLES.

	Num.	*Log.*	*Num.*	*Log.*
Sq. Root	12	1.0791812 × 2	3. 8	
Sq.	144	2.1583624	14.44	1.1595672

2. By the true Negative Indices.

Note, *If you bear any Tens to the Indices, they are affirmative, and are to be abated from the Product of the negative Indices.*

EXAMPLES.

	Num.	*Log.*	*Num.*	*Log.*
Sq. Root	.47		.018	
Sq.	.2209	−1.3441958	.000324	−4.5105450

3. By

3. By the Complements of the true Negative Indices.

Note, *When the* Negative Indices, *being multiplied by* 2, *are above* 10, *then caſt off* 10, *and the Remainder is a* negative Index.

EXAMPLES.

	Num.	*Log.*	*Num.*	*Log.*
Sq. Root	.79		.064	
Sq.	.6241	-9.7952542	.004096	-7.6123600

To extract the SQUARE ROOT.

RULE.

Divide the given *Logarithm* by 2, the Quotient is the *Logarithm* of the Square Root required.

1. By Affirmative Indices.

EXAMPLES.

	Num.	2) *Log.*	*Num.*	*Log.*
Square	144	2.1583624	14.44	
Root	12	1.0791812	3.8	0.5797836

2. By the true Negative Indices.

Note 1. *When the given Logarithm hath a* negative Index, *which cannot evenly be divided by* 2, *add to the ſaid* Index *an Unit or* 1, *putting down the Quotient for a new* Index.

2. *The* Unit *added, as above, muſt be called* 10 *to the next Place of the Diviſion.*

3. *The* Unit *that is added, is what was abated in finding the* Square; *therefore in every odd* negative Index *given with its Logarithm as a Square, an* affirmative Unit *muſt be imagined to have been taken from the Product of the* negative Indices, *according to the Rule in* Addition *of* unlike Indices.

EXAMPLES.

	Num.	*Log.*	*Num.*	*Log.*
Square	.2209		.000324	
Root	.47	-1.6720979	.018	-2.2552725

3. By the Complements of the true negative Indices.

Add 10 to the given Index, and then divide as before.

Note, *The* 10 *which is added, is the* 10 *which was caſt away in finding the Square.*

EXAMPLES.

	Num.	*Log.*	*Num.*	*Log.*
Square	.6241		.004096	
Root	.79	-9.8976271	.064	-8.8061800

To

To Cube a NUMBER by the LOGARITHMS.

Multiply the Logarithm of the given Cube Root by 3, the Product will be the Logarithm of the Cube required.

1. By Affirmative Indices.

EXAMPLES.

	Num.	*Log.*	*Num.*	*Log.*
C. √	9		7	
Cube	729	2.8627275	343	2.5352940

2. By the true Negative Indices.

Note, *If you bear any tens to the* Indices, *they are* affirmative, *and are to be abated from the Product of the* negative Indices.

EXAMPLES.

	Num.	*Log.*	*Num.*	*Log.*
C. √	.11		.91	
Cube	.001331	-3.1241781	.753571	-1.8771242

3. By the Complements of the true Negative Indices.

When the Negative Indices, being multiplied by 3, are above 20, then caſt off 20, and the Remainder is a Negative Index.

EXAMPLES.

	Num.	*Log.*	*Num.*	*Log.*
C. √	.7		.08	
Cube	.343	-9.5352940	.000512	-6.7092700

To extract the CUBE ROOT.

RULE.

Divide the given Logarithm by 3, the Quotient will be the Logarithm of the Cube Root required.

1. By Affirmative Indices.

EXAMPLES.

	Num.	*Log.*	*Num.*	*Log.*
Cube	729		343	
C. √	9	0.9542425	7	0.8450980

2. By the true Negative Indices.

Note 1. *When the given Logarithm has a* negative Index *which cannot be evenly divided by* 3, *add to the* Index *ſo many* Units, *as will make it capable of Diviſion, putting down the Quotient for a new* Index.

2. *The* Units *added, as above, muſt be called ſo many tens to the next Place of the Diviſion.*

3. *The* Units *that are added, are what were abated in finding the* Cube: *therefore in every odd* negative Index *given with its Logarithm as a* Cube, *an* affirmative Unit *or* Units *muſt be imagined to have been taken from the Product of the* negative Indices, *according to* Addition of unlike Indices.

Cube

EXAMPLES.

	Num.	*Log.*	*Num.*	*Log.*
Cube	.001331		.753571	
C. ✓	.11	-1.0413927	.91	-1.9590414

3. By the Complements of the true Negative Indices.

Note 1. *Add* 20 *to the given* Index, *and then divide as before.*

2. *If any thing remains, call it* 10 *or* 20 *to the next Figure.*

3. *The* 20 *that is added, is the* 20 *that was caſt away in finding the* Cube.

EXAMPLES.

	Num.	*Log.*	*Num.*	*Log.*
Cube	.343		.000512	
C. ✓	.7	-9.8450980	.08	-8.9030900

To find a MEAN PROPORTIONAL.

RULE.

Add the Logarithms of the given Numbers together, and take their Half Sum for the Logarithm of the Number required.

EXAMPLES.

1. What is the Mean Proportional between 4 and 9?

4	0.6020600
9	0.9542425
36(6	2)1.5563025
36	0.7781512 = 6
0	

2. What is the Mean Proportional between 3 and 12?

Anſw. 6 or 0.7781512.

3. What is the Mean Proportional between 9 and 16?

Anſw. 12 or 1.0791812.

4. What is the Mean Proportional between 7 and 10?

Anſw. 8.3666+ or 0.9225490.

5. What is the Mean Proportional between 12 and 18?

Anſw. 14.696+ or 1.1672268.

To find a FOURTH PROPORTIONAL.

1. In Direct Proportion.

RULE.

Add the Logarithms of the ſecond and third Terms together, and from that Sum ſubtract the Logarithm of the firſt Term, the Remainder is the Logarithm of the fourth Term.

EXAM-

EXAMPLES.

1. If 2 *oz.* of Silk coſt 2 *s.* 6 *d.* what coſt 7 *lb.* ?

lb.	*oz.*				*Or thus.*	
7 =	112	2	0.3010300	2	0.3010300	
		30	1.4771213	2.5	0.3979400	
		112	2.0492180	112	2.0492180	
			3.5263393		2.4471580	
		1680	3.2253093	140	2.1461280	

Anſw. 1680 *d.* = 7 *l.* *Anſw.* 140 *s.* = 7 *l.*

2. If 45 Ells of Cloth coſt 30 *l.* what coſt 84 Ells? *Anſw.* 1.7481880 = 56 *l.*

3. If 1 *lb.* of any Commodity coſt 1 *s.* 2 *d.* $\frac{3}{4}$, what coſt 1 *C. wt.* ? *Anſw.* 3.8200700 = 6608 *qrs.* = 6 *l.* 17 *s.* 8 *d.*

2. In Inverſe Proportion.

Add the Logarithms of the firſt and ſecond Terms together, and from that Sum ſubtract the Logarithm of the third Term, the Remainder is the Logarithm of the fourth Term.

EXAMPLES.

1. If 60 Bricklayers can make a Wall in 45 Days, how many Days will 40 Bricklayers require to build the ſame? *Anſw.* 1.8293038 = 67.5 *Days.*

2. How much Ground in Length, being 12 Perches broad, will make an Acre? *Anſw.* 1.1249388 = 13.333+ *Perches.*

3. In Simple Intereſt.

1. What is the Simple Intereſt of 220 *l.* for a Year, at 4 *per Cent. per Ann.* ? *Anſw.* 0.9444827 = 8.8 *l.* = 8 *l.* 16 *s.*

2. What is the Simple Intereſt of 76 *l.* for 2 Years, at 5 *per Cent. per Ann.* ?

l. *s.* *l.* *l.*
100 : 10 : : 76 : 7.6

Anſw. 0.8808136 = 7.6 *l.* = 7 *l.* 12 *s.*

3. What is the Amount of 400 *l.* for 12 Years, at 6 *per Cent. per Ann.* Simple Intereſt?

l. *s.* *l.* *l.*
100 : 172 : : 400 : 688

Anſw. 2.8375884 = 688 *l.*

4 In

4. In Compound Intereſt.

RULE.

Multiply the Logarithm of the Amount of 1*l.* at the given Rate *per Cent.* with the Time: then to that Product add the Logarithm of the propoſed Principal; and their Sum will be the Logarithm of the Amount required — *Vide Sch. Aſſiſtant, p.* 156, *for the Amounts of* 1*l. at any propoſed Rate.*

EXAMPLES.

What Sum will 450*l.* amount to in 3 Years, at 5 *per Cent. per Ann.* Compound Intereſt?

1.05	0.0211893
	3
	0.0635679
450	2.6532125
520.93	2.7167804 = 520*l.* 18*s.* 7*d.*+

2. What Sum will 400*l.* amount to in 4 Years at 6 *per Cent. per Ann.* Compound Intereſt? *Anſw.* 2.7032836 = 504.99 = 504*l.* 19*s.* 9½*d.*+

3. What Sum will 480*l.* amount to in 6 Years at 5 *per Cent. per Ann.* Compound Intereſt? *Anſw.* 2.8083770 = 643.246 = 643*l.* 4*s.* 11*d.*+

4. What Sum will 500*l.* amount to in 4 Years, at 4¼ *per Cent. per Ann.* Compound Intereſt? *Anſw.* 2.7712748 = 590.574 = 590*l.* 11*s.* 5*d.* ¾.

5. In Rebate or Diſcount at Simple Intereſt.

RULE.

1. To the *Logarithm* of the Time add the *Logarithm* of the Ratio of the Rate *per Cent.* and note their Sum.

2. To that Sum add the *Logarithm* of the given Sum.

3. Find the Number anſwering to the Sum of the *Logarithms* of the Time and Ratio, and annex an Unit or 1 to it.

4. Find the *Logarithm* of this laſt Number, and ſubtract it from the Sum laſt found; which Difference is the *Logarithm* of the Rebate.

5. Subtract the *Rebate* from the given Sum, the Remainder is the *preſent Worth.*

EXAM-

EXAMPLES.

1. What is the preſent Worth of 795*l.* 11*s.* 2*d.* for 11 Months at 6 *per Cent.*?

				Logarithms.
1	795 11 2	=	795.55833	= 2.90067 9
2	11 Months	=	.91666	= -1.9622083
3	6 *per Cent.*	=	.06	= -2.7781513

	Logarithms.		
4	-1.9622083		
	-2.7781513		
	-2.7403596	=	.054999
	2.9006719		
	1.6410315		
1.054999	= 0.0232520		
	1.6177795	=	41.474

5	795.55833			
	41.474			
		l.	*s.*	*d.*
Anſw.	754.08433	= 754	1	8

2. What is the preſent Worth of 161*l.* 10*s.* for 19 Months at 5 *per Cent.*? *Anſw.* 149.653 = 149*l.* 13*s.* 0*d.* $\frac{3}{4}$+

3. If a Legacy of 1000*l.* is left me the 24th *July*, 1764, to be paid on *Chriſtmas-Day* following; what muſt I receive when I allow 6 *per Cent.* for preſent Payment? *Anſw.* 975.154 = 975*l.* 3*s.* 0*d.* $\frac{3}{4}$+

4. What is the preſent Worth of 4000*l.* payable in 9 Months, at $4\frac{3}{4}$ *per Cent.*? *Anſw.* 3862.085 = 3862*l.* 1*s.* 9*d.* $\frac{1}{2}$

6. In Equation of Payments at Simple Intereſt.

RULE.

1. Find the *Rebate* for each Sum, and the Time of its Payment, as in the laſt Rule.

2. Add thoſe *Rebates* together, and find the *Logarithm* of that Sum.

3. Add the *Logarithms* of the preſent Worth and Ratio together.

4. Subtract

4. Subtract that Sum from the *Logarithm* of the Sum of all the *Rebates*.

5. The correſpondent Number of this Difference is the equated Time required.

EXAMPLES.

1. *A* owes *B* 200*l.* to be paid as follows, *viz.* 100*l.* at 2 Months, and 100*l.* at 4 Months; but they agree to make but one Payment of the Whole, Rebate being made at 6 *per Cent.* I demand the true equated Time?

1 *First Rebate* 0.99234 } *found as in the laſt Rule*
Second Rebate 1.96074 }

Sum 2.95308 = *Logarithms.* 0.4702751

2 *Preſent Worth* 197.04692 = 2.2945696 } *add*
3 *Ratio* .06 = −2.7781519 }

4 *From the firſt Logarithm ſubtract* 1.0727215 *Sum*

−1.3975536 = .24978

5 .24978
12
2.99736
30
29.92080
24
3 68320
18 4160
22.09920
60
5.95200

Anſw. 2*m.* 29*d.* 22*hrs.* 5*min.* which in this Caſe may very well be called 3 Months.

2. A Merchant hath owing to him 300*l.* to be paid as follows, *viz.* 50*l.* at 2 Months, 100*l* at 5 Months, and the reſt at 8 Months; but it is agreed to have but one Payment of the Whole, Rebate being made at 5 *per Cent.* I demand the equated Time? *Anſw.* 5*m.* 29*d.* 9*hrs.* 18*m.* *or* 6 *Months nearly.*

3. *F* owes to *H* 1000 *l.* whereof 200 *l.* is to be paid preſent; 400 *l.* at 5 Months; and the reſt at 10 Months; but they agree to have but one Payment of the Whole, at the Rate of 4 *per Cent.* Rebate; I demand the true equated Time? *Anſw.* 181 *Days — or* 6 *Months*, 1 *Day.*

4. A Man owes to a Merchant 1200 *l.* to be paid as follows, *viz.* 200 *l.* down; 500 *l.* at the End of 10 Months; and the reſt at the End of 20 Months; and they agree to have but one Payment of the Whole, Rebate at 3 *per Cent.* I demand the true equated Time? *Anſw.* 1 *Year*, 11 *Days.*

Note, Rebate *and* Equation *of* Payments *at Compound Intereſt, not being practical, are omitted as uſeleſs.*

To find the ARTIFICIAL SINE, TANGENT, or SECANT to any Number of DEGREES and MINUTES.

RULE.

If the Degrees only, or Degrees and Minutes given, be leſs than 45 Degrees, look for the given Degrees at the Top of the Page, and reckon the Minutes downward: If they are more than 45 Degrees, look for the given Degrees at the Bottom, and reckon the Minutes upwards.

EXAMPLES.

1. What is the Sine, Tangent and Secant of 13°. 30′.?

Anſw. *Sine* – 9.3681853
Tangent 9.3803537
Secant – 10.0121685

2. What is the Sine, Tangent and Secant of 49° 17′?

Anſw. *Sine* – 9.8796375
Tangent 10.0651775
Secant – 10.1855400

Note, *The* Complement *of any Degree and Minute is the Remainder of the ſame from* 90 *Degrees: And the Complement of the* Sine, Tangent, *or* Secant *of any given Degree, is the* Sine, Tangent *or* Secant *of that Remainder.*

EXAMPLES.

3. What are the Complements of the Sine, Tangent, and Secant of 13° 30′?

Anſw. *Sine-complement* – 9.9878315
Tangent-complement 10.6196463
Secant-complement – 10.6318147

4. What are the Complements of the Sine, Tangent, and Secant of 49° 17′?

Anſw. *Sine-complement* – 9.8144600
Tangent-complement 9.9348225
Secant-complement – 10.1203625

Note, *They are alſo called* Co-ſine, Co-tangent, *and* Co-ſecant.

To find the ARITHMETICAL COMPLEMENT of any LOGARITHM.

1. For the Logarithm of any *Number*.

RULE.

Subtract the given Logarithm from 10, the Remainder is the Arithmetical Complement.

EXAMPLES.

1. What is the Arithmetical Complement of the Logarithm of 417?

10.0000000
417 = 2.6201361

Anſw. *Ar. Com.* 7.3798639

2. What is the Arithmetical Complement of the Logarithm of 978? *Anſw.* 7.0096611.

2. For the Logarithm of any *Sine*, *Tangent*, or *Secant*.

If the Characteriſtic of the given Logarithm, with what was borrowed in Subtraction, ſhould make 10, or more than 10, that Sum muſt be taken from 20.

EXAMPLES.

1. What is the Arithmetical Complement of the Sine of 16° 10′?

20.0000000
Sine 9.4447197

Ar. Comp. 10.5552803 = *the Secant of* 73°. 50′.

2. What is the Arithmetical Complement of the Sine of 26°. 19′.? *Anſw.* 10.3532710 = *the Secant of* 63°. 41′.

3. What

3. What is the Arithmetical Complement of the Tangent of 63°. 12′.?

	20.0000000
Tangent	10.2965914
Ar. Comp.	9.7034086 = *the Tangent of* 26°. 48′.

4. What is the Arithmetical Complement of the Tangent of 54°. 27′. *Anſw.* 9.8540694 = *the Tangent of* 35°. 33′.

5. What is the Arithmetical Complement of the Secant of 73°. 50′.?

	20.0000000
Secant	10.5552803
Ar. Comp.	9.4447197 = *the Sine of* 16°. 10′.

6. What is the Arithmetical Complement of the Secant of 63°. 41′.? *Anſw.* 9.6467290 = *the Sine of* 26°. 19′.

Note 1, *The* Complement Arithmetical *of the* Sine *of any given Number of Degrees, is the* Secant *of the* Complement *of thoſe Degrees.*

2. *The* Complement Arithmetical *of the* Secant *of any given Number of Degrees, is the* Sine *of the* Complement *of thoſe Degrees.*

3. *The* Complement Arithmetical *of the* Tangent *of any given Number of Degrees is the* Co-tangent *of thoſe Degrees.*

To find the DEGREES anſwering to any ARTIFICIAL SINE, TANGENT, or SECANT.

EXAMPLES.

1. What are the Degrees and Minutes anſwering to the Sine of 9.3681853.?

Look in the Table of Sines for the given Logarithm, and againſt it ſtands 13°. 30′.

Note, *If the given* Logarithm *is found in the Column whoſe Title is at the Top, the* Degrees *that belong to it, are at the Top alſo, and the* Minutes *are reckoned downward; but if the Title is at the Bottom, the* Degrees *that belong to it are alſo at the Bottom, and the* Minutes *are reckoned upward.*

2. What are the Degrees and Minutes anſwering to the Sine 9.9836643?

3. What are the Degrees anſwering to the Sine 9.9469372?

To find the SECONDS, when the LOGARITHM cannot be found in the TABLE exactly.

RULE.

1. Subtract the next leſſer Sine from that which is greater than the Sine given.
2. Subtract the next leſſer Sine from the Sine given.
3. As the greater Difference
   Is to the leſſer Difference;
   So is 60
   To the Seconds required.

1. For SINES.

EXAMPLES.

1. What are the Degrees, Minutes and Seconds anſwering to the Sine of 9.5001639?

The next greater Sine is	9.5003421
——— *leſſer Sine is*	9.4999633
	3788
The Sine given is — —	9.500 639
next leſſer Sine is —	9.4999633
	2006

3788 : 2006 : : 60 : 32 *nearly.*

The Sine given anſwers to 18°. 26′. 32″.

2. What are the Degrees, Minutes and Seconds anſwering to the Sine 9.7673821? *Anſw.* 35°. 49′. 28″. $\frac{300}{1750}$.

3. What are the Degrees, Minutes and Seconds anſwering to the Sine 6.5763127? *Anſw.* 0°, 1′. 22″. $\frac{132536}{301030}$.

2 For TANGENTS.

1. What are the Degrees, Minutes and Seconds anſwering to the Tangent 9.8765492? *Anſw.* 36°. 57′. 51″.

2. What are the Degrees, Minutes and Seconds anſwering to the Tangent 10.7694237? *Anſw.* 80°. 20′. 57″. $\frac{294}{9638}$.

3. For SECANTS.

1. What are the Degrees, Minutes and Seconds anſwering to the Secant 10.7685321? *Anſw.* 80°. 11′. 20″.

2. What are the Degrees, Minutes and Seconds anſwering to the Secant 10.4738927? *Anſw.* 7 °. 22′. 39″. $\frac{663}{3543}$.

Note, *When the* true negative Indices *are very large, as* -7, -8, -9, *or the* Complements *are very ſmall, as* -1, -2, -3, *the Decimals are removed ſo very far from* Unity, *as that they ſcarcely ever occur in Practice, and therefore Operations of ſuch Numbers are omitted as uſeleſs in this Place eſpecially.*

TABLES of MONY multiplied by MONY;

Shewing the particular Products in PENCE, FARTHINGS, And PARTS of a FARTHING.

TABLE 1.

s. × *s.* 20 = 1*l.*

s.	*d.*	*qr.*
20 = 1	0	0
19 = 0	11	1 $\frac{6}{10}$
18 = 0	10	3 $\frac{2}{10}$
17 = 0	10	0 $\frac{8}{10}$
16 = 0	9	2 $\frac{4}{10}$
15 = 0	9	0
14 = 0	8	1 $\frac{6}{10}$
13 = 0	7	3 $\frac{2}{10}$
12 = 0	7	0 $\frac{8}{10}$
11 = 0	6	2 $\frac{4}{10}$
10 = 0	6	0
9 = 0	5	1 $\frac{6}{10}$
8 = 0	4	3 $\frac{2}{10}$
7 = 0	4	0 $\frac{8}{10}$
6 = 0	3	2 $\frac{4}{10}$
5 = 0	3	0
4 = 0	2	1 $\frac{6}{10}$
3 = 0	1	3 $\frac{2}{10}$
2 = 0	1	0 $\frac{8}{10}$
1 = 0	0	2 $\frac{4}{10}$

TABLE 2.

s. × *d.* 20 = 1*d.*

	d.	*qrs.*	*ths* 10
20 = 1	0		
19 = 0	3	8	
18 = 0	3	6	
17 = 0	3	4	
16 = 0	3	2	
15 = 0	3		
14 = 0	2	8	
13 = 0	2	6	
12 = 0	2	4	
11 = 0	2	2	
10 = 0	2		
9 = 0	1	8	
8 = 0	1	6	
7 = 0	1	4	
6 = 0	1	2	
5 = 0	1		
4 = 0	0	8	
3 = 0	0	6	
2 = 0	0	4	
1 = 0	0	2	

TABLE 3.

s. × *qrs.* 20 = 1*q.*

	qr.	*ths* 10	*ths* 6
20 = 1			
19 = 0	9	3	
18 = 0	9		
17 = 0	8	3	
16 = 0	8		
15 = 0	7	3	
14 = 0	7		
13 = 0	6	3	
12 = 0	6		
11 = 0	5	3	
10 = 0	5		
9 = 0	4	3	
8 = 0	4		
7 = 0	3	3	
6 = 0	3		
5 = 0	2	3	
4 = 0	2		
3 = 0	1	3	
2 = 0	1		
1 = 0	0	3	

TABLE 4.

d. × *d.* 60 = 1*qr.*

	qr.	*ths* 10	*ths* 6
60 = 1			
59 = 0	9	5	
58 = 0	9	4	
57 = 0	9	3	
56 = 0	9	2	
55 = 0	9	1	
54 = 0	9		
53 = 0	8	5	
52 = 0	8	4	
51 = 0	8	3	
50 = 0	8	2	
49 = 0	8	1	
48 = 0	8		
47 = 0	7	5	
46 = 0	7	4	
45 = 0	7	3	
44 = 0	7	2	
33 = 0	7	1	
42 = 0	7		
41 = 0	6	5	
40 = 0	6	4	
39 = 0	6	3	
38 = 0	6	2	
37 = 0	6	1	
36 = 0	6		
35 = 0	5	5	
34 = 0	5	4	
33 = 0	5	3	
32 = 0	5	2	
31 = 0	5	1	
30 = 0	5		
29 = 0	4	5	
28 = 0	4	4	
27 = 0	4	3	
26 = 0	4	2	
25 = 0	4	1	
24 = 0	4		
23 = 0	3	5	
22 = 0	3	4	
21 = 0	3	3	
20 = 0	3	2	
19 = 0	3	1	
18 = 0	3		
17 = 0	2	5	
16 = 0	2	4	
15 = 0	2	3	
14 = 0	2	2	
13 = 0	2	1	
12 = 0	2		
11 = 0	1	5	
10 = 0	1	4	
9 = 0	1	3	
8 = 0	1	2	
7 = 0	1	1	
6 = 0	1		
5 = 0	0	5	
4 = 0	0	4	
3 = 0	0	3	
2 = 0	0	2	
1 = 0	0	1	

TABLE 5.

d. × *qrs.* 240 = 1*qr.*

	qr.	*ths* 10	*ths* 24
33 = 0	1	9	
32 = 0	1	8	
31 = 0	1	7	
30 = 0	1	6	
29 = 0	1	5	
28 = 0	1	4	
27 = 0	1	3	
26 = 0	1	2	
25 = 0	1	1	
24 = 0	1		
23 = 0	0	23	
22 = 0	0	22	
21 = 0	0	21	
20 = 0	0	20	
19 = 0	0	19	
18 = 0	0	18	
17 = 0	0	17	
16 = 0	0	16	
15 = 0	0	15	
14 = 0	0	14	
13 = 0	0	13	
12 = 0	0	12	
11 = 0	0	11	
10 = 0	0	10	
9 = 0	0	9	
8 = 0	0	8	
7 = 0	0	7	
6 = 0	0	6	
5 = 0	0	5	
4 = 0	0	4	
3 = 0	0	3	
2 = 0	0	2	
1 = 0	0	1	

TABLE 6.

qrs. × *qrs.* 960 = $\frac{1}{4}$

	qr.	*ths* 10	*ths* 96
9 = 0	0	9	
8 = 0	0	8	
7 = 0	0	7	
6 = 0	0	6	
5 = 0	0	5	
4 = 0	0	4	
3 = 0	0	3	
2 = 0	0	2	
1 = 0	0	1	

Let this Table front p. 149.

Miſcellaneous Arithmetic:

OR A FULL

ACCOUNT of the NEW CALENDAR, &c.

PART V.

Of the ARITHMETIC of MONY.

1. MULTIPLICATION of MONY by MONY.

The TABLE.

1. *£'s.* by *£'s.* give *£'s.*
2. ——— *S.* — *S.*
3. ——— *D.* — *D.*
4. ——— *qrs.* — *qrs.*
5. *S.* by *S.* 20 = 1 *s.* 5 = 3*d.* & 1 = 2 *qrs.* $\frac{4}{10}$.
6. ——— *D.* 20 = 1 *d.* 5 = $\frac{1}{4}$ & 1 = $\frac{2}{10}$ of $\frac{1}{4}$.
7. ——— *qrs.* 20 = $\frac{1}{4}$ 2 = $\frac{1}{10}$ of $\frac{1}{4}$ & 1 = $\frac{1}{2}$ of $\frac{1}{10}$ of $\frac{1}{4}$ = $\frac{3}{6}$ of $\frac{1}{10}$ of $\frac{1}{4}$.
8. *D.* by *D.* 240 = 1 *d.* 60 = $\frac{1}{4}$ 6 = $\frac{1}{10}$ of $\frac{1}{4}$ & 1 = $\frac{1}{6}$ of $\frac{1}{10}$ of $\frac{1}{4}$.
9. *D.* by *qrs.* 240 = $\frac{1}{4}$ 24 = $\frac{1}{10}$ of $\frac{1}{4}$ & 1 = $\frac{1}{24}$ of $\frac{1}{10}$ of $\frac{1}{4}$.
10. *qrs.* by *qrs.* 960 = $\frac{1}{4}$ 96 = $\frac{1}{10}$ of $\frac{1}{4}$ & 1 = $\frac{1}{960}$ of $\frac{1}{10}$ of $\frac{1}{4}$ = $\frac{1}{10}$ of $\frac{1}{6}$ of $\frac{1}{10}$ of $\frac{1}{4}$.

1. Of POUNDS and SHILLINGS multiplied by POUNDS and SHILLINGS.

EXAMPLE 1.

	l.	*s.*		
Multiply	7	4		
By	3	8		
	21	12		
	2	17	7	$0\frac{4}{5}$
Product	24	9	7	$0\frac{4}{5}$

1. Here I multiply the 7 *l.* 4 *s.* firſt by 3 *l.* (which give Pounds and Shillings for the Product) ſaying 3 times 4 is 12, which ſet down in the Place of Shillings; and 3 times 7 is 21, which ſet down in the Place of Pounds.

2. In the next Place I multiply the ſame 7 *l.* 4 *s.* by the 8 *s.* (which

give Shillings, Pence, and Parts of a Farthing) saying 8 times 4 is 32, set down 12 (in a By-Place) and carry 1; then 8 times 7 is 56, and 1 that I carried is 57*s.* or 2*l.* 17*s.* which set down.

3. To find the Value of the 12 just mentioned, you may do it by Practice, thus

When Shillings are multiplied by Shillings, 20 make 1 Shilling, consequently 10 must be the Half of 20, and 2 the Fifth of 10.

		s.
20	=	1
10	$\frac{1}{2}$	0 6
2	$\frac{1}{5}$	0 1 $0\frac{4}{5}$
		0 7 $0\frac{4}{5}$

and this 7*d.* 0*qrs.* $\frac{4}{5}$, is the Value of the 12, and to be annexed to the 2*l.* 17*s.* which makes 2*l.* 17*s.* 7*d.* 0*qrs.* $\frac{4}{5}$; then add them as in Addition of Mony, the Total is the Product.

PROOF.

1. By inverting the Factors.

	l.	*s.*			
Multiply	3	8			
By	7	4			
	23	16			
	13	7	0	$\frac{8}{10}$	
	24	9	7	0	$\frac{8}{10}$

2. By Practice.

s.		*l.*	*s.*			
		7	4			
4	$\frac{1}{5}$	3	8			
		21	12			
4	$\frac{1}{5}$	1	8	9	2	$\frac{2}{5}$
		1	8	9	2	$\frac{2}{5}$
		24	9	7	0	$\frac{4}{5}$

3. By

3. By Vulgar Fractions.

Multiply *l.* 7 *s.* 4 by *l.* 3 *s.* 8

1. $4^{s.} = \frac{4}{20} = \frac{1}{5}$ *and* $8^{s.} = \frac{8}{20} = \frac{2}{5}$.

2. $7^{l.}\frac{1}{5} = \frac{36}{5}$ *and* $3^{l.}\frac{2}{5} = \frac{17}{5}$.

3. $\frac{36}{5} \times \frac{17}{5} = \frac{612}{25}$.

4.
25)612(24 *l.*
50
112
100
12
20
25)240(9 *s.*
225
15
12
25)180(7
175
5
4
25)20(0 $\frac{20}{25}$

Note, $\frac{20}{25} = \frac{4}{5}$.

4. By Decimals.

l. *s.* *l.* *s.*
7 4 = 7.2 and 3 8 = 3.4

7.2
3.4

288
216

£24.48
20
---
s. 9.60
12

D. 7.20
4

0.80

Note 1, 0.8 *of a Farthing, or* $\frac{8}{10}$ *is* $\frac{4}{5}$.

2. *The foregoing Trouble may, in a great Meaſure, be ſaved, by uſing the annexed* Tables; *however, in the mean Time, it cannot be amiſs to underſtand what has been done, though no other Uſe be made of it.*

EXAMPLE 2.

		l.	*s.*			
	Multiply	7	16			
	By	12	19			
1.	7*l.* × 12*l.* = - - - - -	84	0			
2.	16*s.* × 12*l.* = 192*s.* = -	9	12			
3.	7*l.* × 19*s.* = 133*s.* = -	6	13			
4.	16*s.* × 19*s.* = 304 = -	0	15			
	and 4 *over* -	0	0	2	1	$\frac{6}{10}$
	Product	101	0	2	1	$\frac{6}{10}$

EXAM-

EXAMPLE 3.

					l.	*s.*		
				Multiply	9	12		
				By	9	12		
1.	9*l.*	×	9*l.*	= - -	81	0		
2.	12*s.*	×	9*l.*	= 108*s.* -	5	8		
3.	9*l.*	×	12*s.*	= 108*s.* -	5	8		
4.	12*s.*	×	12*s.*	= 144 =		7		
				and 4 over =		0	2	1 $\frac{6}{10}$
				Product	92	3	2	1 $\frac{6}{10}$

More Examples for Practice.

	l.	*s.*				*l.*	*s.*				*l.*	*s.*			
Multiply	4	9				12	8				7	12			
By	7	16				3	14				8	11			
Prod.	34	14	3	1	$\frac{6}{10}$	45	17	7	0	$\frac{8}{10}$	64	19	7	0	$\frac{8}{10}$

	l.	*s.*				*l.*	*s.*				*l.*	*s.*			
Multiply	12	15				8	16				10	14			
By	10	14				3	12				1	16			
Prod.	136	8	6			31	11	7	0	$\frac{8}{10}$	19	5	2	1	$\frac{6}{10}$

	l.	*s.*				*l.*	*s.*				*l.*	*s.*			
Multiply	2	10				7	4				3	19			
By	4	12				2	19				5	16			
Prod.	11	10				21	4	9	2	$\frac{4}{10}$	22	18	2	1	$\frac{6}{10}$

Of SHILLINGS and PENCE multiplied by SHILLINGS and PENCE; a Pound being the Integer.

EXAMPLE I.

		s.	d.	
	Multiply	12	4	
	By	6	10	
1.	12*s.* × 6*s.* = 72 = 3 *twenties* =	3	0	
	and 12 *over* = $\frac{12}{20}$ *of a Shilling* =	0	7	0 $\frac{8}{10}$
2.	4*d.* × 6*s.* = 24 = 1 *twenty* =	0	1	0
	and 4 *over* = $\frac{4}{20}$ *of a Penny* =	0	0	0 $\frac{8}{10}$
3.	12*s.* × 10*d.* = 120 = 6 *twenties* =	0	6	0
4.	4*d.* × 10*d.* = 40 = $\frac{40}{60}$ *of a Far.* =	0	0	0 $\frac{6}{10}$ $\frac{4}{6}$
	Product	£4	2	2 $\frac{2}{10}$ $\frac{4}{6}$

I think the above Explanation of the Operation is full as clear as that which went next before, and contained a larger Quantity of Words: If there be any Difficulty, it muſt proceed from the want of knowing, when Shillings are multiplied by Shillings, how 20 muſt make 1 Shilling; and this I will explain in the following Manner.

1. As a Pound is the Integer, and 20*s.* make 1 Pound, it is to be underſtood that any Number of Shillings are ſo many twentieth Parts of a Pound; conſequently 1*s.* muſt be = $\frac{1}{20}$ of a Pound.

2. If $\frac{1}{20}$*l.* be multiplied by $\frac{1}{20}$*l.* the Product will be = $\frac{1}{400}$*l.*

Thus $\frac{1}{20} \times \frac{1}{20} = \frac{1}{400}$*l.*

3. As $\frac{1}{400}$*l.* is leſs than a Penny, a Pound making but 240*d.* therefore let the Number of Farthings in a Pound, *viz.* 960, be divided by 400, the Quotient will be 2*qrs.* $\frac{2}{5}$.

Thus 400)960(2

$\frac{160}{400} = \frac{16}{40} = \frac{2}{5}$.

4. If 2*qrs.* $\frac{2}{5}$ be multiplied by 20, the Product will be = 48 Farthings, which is juſt 1 Shilling,

1. Thus $2\frac{2}{5} = \frac{12}{5}$.
2. $\frac{12}{5} \times \frac{20}{1} = \frac{240}{5}$.
3. 5)240(48*qrs.* = 1*s.*

Hence it appears that when Shillings are multiplied by Shillings, 1 Pound being the Integer, 20 muſt go for 1 Shilling.

The

The ſame Thing appears alſo by Decimals, thus;

The Decimal Parts of a *l.* = 1 *s.* make .05.

Then	.05	*laſtly*	2.4
	.05		20
	.0025	*qrs.*	48.0
	960		
	1500		
	225		
qrs.	2.4000		

But methinks I hear my Reader ſay, He underſtands by the foregoing Explication, how, when Shillings are multiplied by Shillings, that 20 muſt go for 1 Shilling, but is ſtill at a Loſs, when Shillings and Pence are multiplied together, to know how 20 muſt go for a Penny. Now this may be known by obſerving what follows, *viz.*

1. Every Pound contains 240 *d.* and therefore any Number of Pence are ſo many two hundred and fortieth Parts of a Pound, conſequently 1 *s.* or 12 *d.* muſt make $\frac{12}{240}$ of a *l.* and 1 Penny $\frac{1}{240}$ of a Pound.

2. Multiply $\frac{12}{240}$ and $\frac{1}{240}$ together, and they will produce $\frac{12}{57600}$,

Thus, $\frac{12}{240} \times \frac{1}{240} = \frac{12}{57600} = \frac{1}{4800}$.

3. As Farthings are the ſmalleſt of our Mony, and 960 *qrs.* make a *l.* ſo *that* Number ſhould be divided by 4800, but as it cannot, a Fraction muſt be made of it, thus, $\frac{960}{4800}$. which reduced to its loweſt Terms, is $= \frac{1}{5}$ of a Farthing.

4. Multiply $\frac{1}{5}$ by 20, the Product will be four Farthings,

Thus, $\frac{1}{5} \times \frac{20}{1} = \frac{20}{5}$ of a Farthing.

Then, 5)20(4 Farthings = 1 Penny.

The ſame by Decimals.

4800.)960.0(.2 of a Farthing
960.0
0

4. Multiply

4. Multiply .2 by 20, and the Product will be 4 *qrs.* or 1 Penny, thus,

.2
20
qrs. 4.0

After this Method of arguing, it will appear upon Trial, that Pence multiplied by Pence, or $\frac{1}{240}$ by $\frac{1}{240}$, will give 240 for 1 Penny, the fourth Part of which is 60 for 1 Farthing: Likewiſe $\frac{4}{960}$ by $\frac{1}{960}$ will give 240 for 1 Farthing, when Pence and Farthings are multiplied: Alſo $\frac{1}{960}$ by $\frac{1}{960}$, will give 960 for 1 Farthing, when Farthings are multiplied by Farthings.

But ſtill the inquiſitive Reader may ſtand amazed, when he ſees that 12*s.* 4*d.* and 6*s.* 10*d.* being multiplied together, ſhall produce no more real Mony than 4*s.* 2*d.* $\frac{1}{2}$, when almoſt every one can tell, that 12*s.* and 6*s.* multiplied together, will make 72*s.* or 3*l.* 12*s.* But if it be conſidered, that 1 Pound is the Integer, and not 1 Shilling, and that Fractions being multiplied together, will always decreaſe or leſſen their Value, that Difficulty will vaniſh.

Every one can tell that 10*s.* multiplied by 10*s.* if they are regarded as Integers will produce 100*s.* or 5*l.* but if it be conſidered that 10*s.* is the Half of a Pound, and that if $\frac{1}{2}$ of a *l.* be multiplied by $\frac{1}{2}$ of a *l.* we ſhall find the Product diminiſh greatly:

Thus, $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ *l.* = 5 *Shil.*

Decimally .5
·5
.25
20
s. 5.00

Proof of the foregoing Example.

1. By inverting the Factors.

		s.	*d.*	
	Multiply	6	10	
	By	12	4	
1.	6*s.* × 12*s.* = 72 = 3 *twenties* =	- 3	0	
	and 12 *over* = $\frac{12}{20}$ *of a Shilling* =	0 7	0	$\frac{8}{10}$
2.	10*d.* × 12*s.* = 120 = 6 *twenties* =	0 6	0	
3.	6*s.* × 4*d.* = 1 *twenty* = - - -	0 1	0	
	and 4 *over* = $\frac{1}{20}$ *of a Penny* = -	0 0	0	$\frac{8}{10}$
4.	10*d.* × 4*d.* = 40 = $\frac{40}{60}$ *of a Farth.* =	0 0	0	$\frac{8}{10}$ $\frac{4}{6}$
	Product	4 2	2	$\frac{2}{10}$ $\frac{4}{6}$

2. By Practice.

s.		*l.*	*s.*	*d.*
5	$\frac{1}{4}$	0	12	4
1	$\frac{1}{5}$	0	3	1
6*d*	$\frac{1}{2}$	0	0	7 $\frac{1}{4}$ .6
4	$\frac{1}{3}$	0	0	3 $\frac{1}{2}$ .8
		0	0	2 $\frac{1}{4}$ .86+
		0	4	2 $\frac{1}{2}$ .26

Note 1. *There is a small Difference in the Fraction, owing to a Defect in the Decimal.*

2. *If the Operation had been inverted, and the Parts of* 12 *s.* 4 *d. been taken from* 6 *s.* 10 *d. it would be the same.*

3. By Vulgar Fractions.

1. 12 *s.* 4 *d.* = $\frac{148}{240}$.
2. 6 *s.* 10 *d.* = $\frac{82}{240}$.
3. $\frac{148}{240} \times \frac{82}{240} = \frac{12136}{57600}$ *l.*
4. 12136
20

576100)242720(4 *s.*
2304

12320
12

576100)147840(2 *d.*
1152

32640
4

576100)130560(2 *qrs.*
1152

15360

57600

Note, $\frac{15360}{57600} = \frac{16}{60}$; *and if* $\frac{4}{6}$ *of* $\frac{1}{10}$ *and* $\frac{2}{10}$ *are added together, they will make* $\frac{16}{60}$ *also.*

4. By

4. By Decimals.

12	4.
20	12.333+
	.616+ = 12 *s.* 4 *d.*

12	10.
20	6.833+
	.341+ = 6 *s.* 10 *d.*

.616 × .342 = .210672 *of a l.*

20

s. 4.21344

12

d. 2.56128

4

qrs. 2.24592

Note, *The* Remainder *will not be exact in the Fractional Part, becauſe of the ſeveral Defects in the Decimal Diviſions above, which is the Reaſon why* .341 *is changed into* .342.

EXAMPLE 2.

		s.	*d.*		
	Multiply	7	10		
	By	6	5		
1.	7 *s.* × 6 *s.* = 42 = 2 *twenties* =	2	0		
	and 2 *over* =	0	1	0	$\frac{8}{10}$
2.	10 *d.* × 6 *s.* = 60 = 3 *twenties* =	0	3	0	
3.	7 *s.* × 5 *d.* = 35 = 1 *twenty* =	0	1	0	
	and 15 *over* =	0	0	3	
4.	10 *d.* × 5 *d.* = 50 =	0	0	0	$\frac{8}{10}$ $\frac{2}{6}$
	Product	2	6	0	$\frac{6}{10}$ $\frac{2}{6}$

EXAM-

EXAMPLE 3.

		s.	d.		
	Multiply	8	9		
	By	5	11		
1.	8 *s.* × 5 *s.* = 40 = 2 *twenties* =	2	0		
2.	9 *d.* × 5 *s.* = 45 = 2 *twenties* =	0	2		
	and 5 *over* =	0	0	1	
3.	8 *s.* × 11 *d.* = 88 = 4 *twenties* =	0	4	0	
	and 8 *over* =	0	0	1	$\frac{6}{10}$
4.	9 *d.* × 11 *d.* = 99 = 1 *sixty* =	0	0	1	
	and 39 *over*	0	0	0	$\frac{6}{10}$ $\frac{3}{6}$
	Product	2	7	0	$\frac{2}{10}$ $\frac{3}{6}$

More Examples for Practice.

	s.	d.			s.	d.		
Multiply	16	8			14	6		
By	7	11			9	3		
Product	6	7	0	$\frac{6}{10}$ $\frac{4}{6}$	6	8	1	$\frac{9}{10}$

	s.	d.			s.	d.		
Multiply	6	4			12	6		
By	7	4			3	8		
Product	2	3	3	$\frac{4}{10}$ $\frac{4}{6}$	2	3	1	$\frac{1}{2}$

	s.	d.			s.	d.		
Multiply	3	6			10	2		
By	4	7			3	6		
Product	0	9	2	$\frac{5}{10}$	1	9	1	$\frac{4}{10}$

	l.	s.	d.			l.	s.	d.		
Multiply	3	17	4			4	17	2		
By	7	14	2			3	7	5		
Product	29	16	1	1	$\frac{3}{10}$ $\frac{2}{6}$	16	7	6	1	$\frac{5}{10}$ $\frac{4}{6}$

	l.	s.	d.			l.	s.	d.		
Multiply	4	10	8			3	12	7		
By	7	4	9			2	12	1		
Product	32	16	2	1	$\frac{6}{10}$	9	9	0	0	$\frac{9}{10}$ $\frac{1}{6}$

3. PENCE and FARTHINGS multiplied by PENCE and FARTHINGS.

EXAMPLE I.

		d.
	Multiply	10 $\frac{1}{2}$
	By	9 $\frac{3}{4}$

1. 10*d.* × 9*d.* = 90 = 1 *sixty* = — 0 1
   and 30 *over* = — — — — 0 0 $\frac{5}{10}$
2. 2*qrs.* × 9*d.* = 18 = — — — — 0 0 0 $\frac{18}{24}$ *or* $\frac{72}{96}$
3. 10*d.* × 3*qrs.* = 30 = 1 *twenty four* = 0 0 $\frac{1}{10}$
   and 6 *over* = — — — — — 0 0 0 $\frac{6}{24}$ *or* $\frac{24}{96}$
4. 2*qrs.* × 3*qrs.* = 6 = $\frac{6}{96}$ *of* $\frac{1}{10}$ *of* $\frac{1}{4}$ = 0 0 0 $\frac{6}{96}$

Product 0 1 $\frac{7}{10}$ $\frac{6}{96}$

Note, *The* $\frac{18}{24}$ *and* $\frac{6}{24}$ *are reduced to* $\frac{72}{96}$ *and* $\frac{24}{96}$, *to accommodate them to the* $\frac{6}{96}$, *becauſe the* $\frac{6}{96}$ *could not be reduced to any Number of twenty-fourths.*

Proof.

1. By Practice.

		d.
		10 $\frac{1}{2}$
6	$\frac{1}{10}$	0 1.05
3	$\frac{1}{2}$	0 0.525
$\frac{3}{4}$	$\frac{1}{4}$	0 0.13125
		0 1.70625

Here 'tis plain, that 1.7 are the ſame as 1$\frac{7}{10}$ above, and if the .90625 are equal to $\frac{6}{96}$, that muſt be right alſo.

96)6.00000(.00625
5 76
240
192
.480
480
0

Another

Another Way for the Fractions.

Add $\frac{7}{10}$ and $\frac{6}{90}$ of $\frac{1}{10}$ together.

$\frac{6}{90}$ *of* $\frac{1}{10} = \frac{6}{900} = \frac{1}{100}$

and $\frac{7}{10}$ *are equal to* $\frac{112}{160}$

$\frac{112}{160} + \frac{1}{160} = \frac{113}{160}$

```
1610)113.000010(.70625
     112
     ---
      100
       96
      ---
       40
       32
      ---
        80
        80
       ---
         0
       ---
```

Hence it is very plain, that 10 *d.* $\frac{1}{2}$ and 9 *d.* $\frac{3}{4}$, being multiplied together, will produce no more than 1 Farthing, and $\frac{7}{10}$ and $\frac{6}{90}$ of $\frac{1}{10}$; and alſo that it is the ſame with 1.70625.

2. By Vulgar Fractions.

d.

1. 10 $\frac{1}{2} = \frac{42}{900}$ *of a l.*
2. 9 $\frac{3}{4} = \frac{39}{900}$ *of a l.*
3. $\frac{42}{900} \times \frac{39}{900} = \frac{1638}{921000} = \frac{91}{51200}$.

91

960 = *the Farthings in* 1 *l.*

546

819

```
51200)87360(1 qr. 36160/51200
      51200
      -----
      36160
      -----
```

Here the Farthing appears with a Fraction to it; and if this Fraction $\frac{36160}{51200}$ is equal to $\frac{7}{10}$ and $\frac{6}{90}$ of $\frac{1}{10}$, it muſt be right this Way alſo.

In

In the foregoing Page, it appears that $\frac{7}{10}$ and $\frac{6}{96}$ of $\frac{1}{10}$, being added together, are $= \frac{113}{100}$, and whether this be increaſed by Multiplication, or the other decreaſed by Diviſion, it matters not; both amount to the ſame Thing: therefore

Let $\frac{36161}{51120}$ *be reduced to its loweſt Parts.*

$$8)\frac{36161}{51120}(\overset{4}{4}\frac{52}{640}(\frac{113}{100}$$ *as before.*

d. 3. By Decimals.

1. $10\frac{1}{2} = .043749$
2. $9\frac{3}{4} = .040625$
3. $.043749 \times .040625 = .0017773125$
4. $.0017773125$
   20
   0.03554620
   12
   $.4265544$
   4
   1.7062176

This is not exactly true, becauſe ſome Decimal Diviſions have no End; and ſtop where you will, there will be a Deficiency in the Quotient, becauſe there are ſtill ſome Figures wanting; and if to ſupply that Want, you make any one of them but one, or a ſingle Unit more than it really ſhould be, which is often done to ſave Trouble, then there will be a Redundancy. However, this is near enough.

EXAMPLE 2.

		d.									
	Multiply	11	$\frac{3}{4}$								
	By	11	$\frac{3}{4}$								
1.	11 *d.* × 11 *d.* = 121 = 2 *ſixties* =	0	2								
	and 1 *over* =	-	-	-	-	0	0	0	$\frac{1}{6}$	=	$\frac{16}{96}$
2.	3 *qrs.* × 11 *d.* = 33 = $\frac{33}{24}$ =	-	-	-	-	0	0	$\frac{1}{10}$	0	$\frac{9}{24}$ =	$\frac{36}{96}$
3.	11 *d.* × 3 *qrs.* = 33 = $\frac{33}{24}$ =	-	-	-	-	0	0	$\frac{1}{10}$	0	$\frac{9}{24}$ =	$\frac{36}{96}$
4.	3 *qrs.* × 3 *qrs.* = 9 =	-	-	-	-	0	0	0	0	0	$\frac{9}{96}$
	Product	0	2	$\frac{3}{10}$							$\frac{1}{96}$

EXAM-

EXAMPLE 3.

											d.			
										Multiply	2	$\frac{1}{2}$		
										By	3	$\frac{1}{4}$		
1.	2 *d.*	×	3 *d.*	=	6	=	–	–	–	–	0	0	$\frac{1}{10}$	
2.	2 *qrs.*	×	3 *d.*	=	6	=	–	–	–	–	0	0	0	$\frac{6}{24} = \frac{23}{96}$
3.	2 *d.*	×	1 *qr.*	=	2	=	–	–	–	–	0	0	0	$\frac{2}{24} = \frac{8}{96}$
4.	2 *qrs.*	×	1 *qr.*	=	2	=	–	–	–	–	0	0	0	0 $\frac{2}{96}$
										Product	0	0	$\frac{1}{10}$	$\frac{34}{96}$

More Examples for Practice.

	d.			d.			d.		
Multiply	4	$\frac{1}{2}$		8	$\frac{1}{4}$		9	$\frac{1}{4}$	
By	7	$\frac{1}{4}$		6	$\frac{3}{4}$		10	$\frac{1}{2}$	
Product	0	0	$\frac{5}{10}$ $\frac{42}{96}$	0	0	9 $\frac{27}{96}$	0	1	$\frac{6}{10}$ $\frac{18}{96}$

	d.			d.			d.		
Multiply	10	$\frac{3}{4}$		11	$\frac{1}{2}$		3	$\frac{1}{2}$	
By	11	$\frac{1}{2}$		7	$\frac{3}{4}$		4	$\frac{1}{4}$	
Product	0	2	0 $\frac{58}{96}$	0	1	$\frac{4}{10}$ $\frac{82}{96}$	0	0	$\frac{2}{10}$ $\frac{46}{96}$

	l.	s.	d.				l.	s.	d.			
Multiply	12	10	6	$\frac{1}{2}$			7	8	6	$\frac{1}{4}$		
By	4	11	8	$\frac{1}{4}$			9	7	8	$\frac{3}{4}$		
Product	57	8	6	3	$\frac{6}{10}$	$\frac{90}{96}$	69	14	1	0	0	$\frac{59}{96}$

	l.	s.	d.				l.	s.	d.			
Multiply	24	11	8	$\frac{3}{4}$			46	10	8	$\frac{3}{4}$		
By	12	16	7	$\frac{1}{4}$			13	12	8	$\frac{1}{2}$		
Product	315	8	11	3	$\frac{4}{10}$	$\frac{7}{96}$	634	10	10	2	$\frac{2}{10}$	$\frac{38}{96}$

	l.	s.	d.				l.	s.	d.			
Multiply	17	16	9	$\frac{1}{4}$			10	11	8	$\frac{1}{4}$		
By	12	19	7	$\frac{1}{4}$			12	10	4	$\frac{1}{2}$		
Product	231	10	11	2	0	$\frac{65}{96}$	132	10	0	3	0	$\frac{18}{96}$

2. DIVISION of MONY by MONY.

DIVISION of Mony by Mony, bears a very near Relation to Diviſion of Feet, Inches and Seconds by Feet, Inches and Seconds; Regard being had to the Manner of multiplying Mony by Mony, as before.

1. Of dividing POUNDS, SHILLINGS, &c. by POUNDS and SHILLINGS.

EXAMPLE I.

	l.	*s.*	*d.*	*qrs.*		*l.*	*s.*
Divide	24	9	7	0	$\frac{4}{5}$ by	3	8

	l.	*s.*	*l.*	*s.*	*d.*	*qr.*	*l.*	*s.*
	3	8)	24	9	7	0 $\frac{4}{5}$ (	7	4
3*l.* 8*s.* × 7 *l.* =			23	16				
				13	7	0 $\frac{4}{5}$		
3*l.* 8*s.* × 4*s.* =			-	13	7	0 $\frac{4}{5}$		
						0		

The Explanation.

1. Aſk how many times 3 *l.* are contained in 24 *l.*
2. The Anſwer is 8.
3. But becauſe 3 *l.* 8 *s.* multiplied by 8 *l.* would produce more than 24 *l.* therefore
4. Try 7 times, which ſet down in the Quotient.
5. Multiply the 3 *l.* 8 *s.* by it, and that gives 23 *l.* 16 *s.*
6. Set it down, and ſubtract it from the upper Line.
7. The Remainder is 13 *s.* 7 *d.* 0 *qrs.* $\frac{4}{5}$.
8. Aſk how many times 3 *l.* are contained in 13 *s.*
9. The Anſwer is 4 for 4 *s.*

Note, *As Pounds and Shillings multiplied together produce Shillings; ſo Shillings being divided by Pounds give Shillings likewiſe.*

10. Set down the 4 *s.* in the Quotient, and multiply he 3 *l.* 8 *s.* by it, the Product will give 13 *s.* 7 *d.* 0 *qr.* $\frac{4}{5}$; which makes nothing Remain.

Note, *This Example is a Proof to the firſt Example in* Multiplication.

EXAM-

EXAMPLE 2.

	l.	*s.*	*d.*	*qr.*		*l.*	*s.*
Divide	101	0	2	1 $\frac{6}{10}$	by	12	19

	l.	*s.*	*l.*	*s.*	*d.*	*qr.*	*l.*	*s.*
	12	19	101	0	2	1 $\frac{6}{10}$	7	16
12*l.* 19*s.* × 7			90	13				
			10	7	2	1 $\frac{6}{10}$		
12*l.* 19*s.* × 16			10	7	2	1 $\frac{6}{10}$		
						0		

EXAMPLE 3.

	l.	*s.*	*d.*	*qr.*		*l.*	*s.*
Divide	92	3	2	1 $\frac{6}{10}$	by	9	12

	l.	*s.*	*l.*	*s.*	*d.*	*qr.*	*l.*	*s.*
	9	12	92	3	2	1 $\frac{6}{10}$	9	12
9*l.* 12*s.* × 9*l.*			86	8				
			5	15	2	1 $\frac{6}{10}$		
9*l.* 12*s.* × 12*s.*			5	15	2	1 $\frac{6}{10}$		
						0		

More Examples for Practice.

l.	*s.*	*l.*	*s.*	*d.*	*qr.*	
7	16)	34	14	3	1 $\frac{6}{10}$	(
3	14)	45	17	7	0 $\frac{8}{10}$	(
8	11)	64	19	7	0 $\frac{8}{10}$	(
10	14)	136	8	6		(
3	12)	31	11	7	0 $\frac{8}{10}$	(
1	16)	19	5	2	1 $\frac{6}{10}$	(
4	12)	11	10			(
2	19)	21	4	9	2 $\frac{4}{10}$	(
5	12)	22	18	6	1 $\frac{6}{10}$	(

2. Of dividing SHILLINGS, PENCE, &c. by SHILLINGS and PENCE.

EXAMPLE 1.

Divide 4 2 2 $\frac{2}{10}$ $\frac{4}{6}$ by 6 10

6 10)4 2 2 $\frac{2}{10}$ $\frac{4}{6}$ (12 4

6s. 10d. × 12s. = 4 1 0 $\frac{8}{10}$

6s. 10d. × 4d. = 1 1 $\frac{4}{10}$ $\frac{4}{6}$

1 1 $\frac{4}{10}$ $\frac{4}{6}$

0

EXAMPLE 2.

Divide 2 6 0 $\frac{6}{10}$ $\frac{2}{6}$ by 6 5

6 5) 2 6 0 $\frac{6}{10}$ $\frac{2}{6}$ (7 10

6s. 5d. × 7s. = 2 2 3 $\frac{8}{10}$

6s. 5d. × 10d = 3 0 $\frac{8}{10}$ $\frac{2}{6}$

3 0 $\frac{8}{10}$ $\frac{2}{6}$

0

EXAMPLE 3.

Divide 2 7 0 $\frac{2}{10}$ $\frac{3}{6}$ by 5 11

5 11)2 7 0 $\frac{2}{10}$ $\frac{3}{6}$ (8 9

5s. 11d. × 8s. 2 4 1 $\frac{6}{10}$

2 2 $\frac{6}{10}$ $\frac{3}{6}$

5s. 11d. × 9d. 2 2 $\frac{6}{10}$ $\frac{3}{6}$

0

More Examples for Practice.

s.	*d.*	*s.*	*d.*	*qr.*		
7	11)6	7	0	$\frac{6}{10}$	$\frac{4}{6}$(	
14	6)6	8	1	$\frac{9}{10}$	(	
7	4)2	3	3	$\frac{4}{10}$	$\frac{4}{6}$(	
3	8)2	3	2		(	
4	7)0	9	2	$\frac{5}{10}$	(	
3	6)1	9	1	$\frac{4}{10}$	(	

l.	*s.*	*d.*	*l.*	*s.*	*d.*	*qrs.*		
7	14	2)29	16	1	1	$\frac{3}{10}$	$\frac{2}{6}$(	
3	7	5)16	7	6	1	$\frac{5}{10}$	$\frac{4}{6}$(	
7	4	9)32	16	2	1	$\frac{6}{10}$	(	
2	12	1) 9	9	0	0	$\frac{9}{10}$	$\frac{1}{6}$(	

3. Of Dividing PENCE, FARTHINGS, *&c.* by PENCE and FARTHINGS.

EXAMPLE 1.

Divide 1 *qr.* $\frac{7}{10}$ $\frac{6}{96}$ by 9 *d.* $\frac{3}{4}$

9 *d.* 3 *qrs.*)1 $\frac{7}{10}$ $\frac{6}{96}$ (10 *d.* 2 *qrs.*

9 *d.* 3 *qrs.* × 10 = 1 $\frac{6}{10}$ $\frac{24}{96}$

$\frac{78}{96}$

9 *d.* 3 *qrs.* × 2 *qrs.* = $\frac{78}{96}$

0

EXAMPLE 2.

Divide 2 *qrs.* $\frac{3}{10}$ $\frac{1}{96}$ by 11 *d.* $\frac{3}{4}$

11 $\frac{3}{4}$ *d.*)2 $\frac{3}{10}$ $\frac{1}{96}$ (11 *d.* 3 *qrs.*

11 *d.* 3 *qrs.* × 11 *d.* = 2 $\frac{1}{10}$ $\frac{52}{96}$

$\frac{1}{10}$ $\frac{45}{96}$

11 *d.* 3 *qrs.* × 3 *qrs.* = $\frac{1}{10}$ $\frac{45}{96}$

0

EXAM-

EXAMPLE 3.

Divide 0 $\frac{1}{10}$ $\frac{34}{96}$ *qr.* by 3 $\frac{1}{4}$ *d.*

d. *qr.* *d.* *qrs.*

3 $\frac{1}{4}$)0 $\frac{1}{10}$ $\frac{34}{96}$ (2 2

3*d.* 1*qr.* × 2 = $\frac{1}{10}$ $\frac{8}{96}$

$\frac{26}{96}$

3*d.* 1*qr.* × 2 $\frac{26}{96}$

0

More Examples for Practice.

d. *qr.*

7 $\frac{1}{4}$)0 $\frac{5}{10}$ $\frac{42}{96}$ (

6 $\frac{3}{4}$)0 $\frac{9}{10}$ $\frac{27}{96}$ (

10 $\frac{1}{2}$)1 $\frac{6}{10}$ $\frac{18}{96}$ (

11 $\frac{1}{2}$)2 0 $\frac{58}{96}$ (

7 $\frac{3}{4}$)1 $\frac{4}{10}$ $\frac{82}{96}$ (

4 $\frac{1}{4}$)0 $\frac{2}{10}$ $\frac{46}{96}$ (

l.	*s.*	*d.*	*l.*	*s.*	*d.*	*qrs.*
4	11	8 $\frac{1}{4}$)	57	8	6	3 $\frac{6}{10}$ $\frac{90}{96}$ (
9	7	8 $\frac{3}{4}$)	69	14	1	0 0 $\frac{39}{96}$ (
12	16	7 $\frac{1}{4}$)	315	8	11	3 $\frac{4}{10}$ $\frac{7}{96}$ (
13	12	8 $\frac{1}{2}$)	634	10	10	2 $\frac{2}{10}$ $\frac{38}{96}$ (
12	19	7 $\frac{1}{4}$)	231	10	11	2 0 $\frac{63}{96}$ (
12	10	4 $\frac{1}{2}$)	132	10	0	3 0 $\frac{18}{96}$ (

3. Of

3. Of the SINGLE RULE OF THREE, wrought only by MONY.

1. Of DIRECT PROPORTION.

1. If I give 7 *l.* for the Intereſt of 100 *l.* 10 *s.* for a Year, how much muſt I give for the Intereſt of 30 *l.* for the ſame Time?

l. *s.* *l.* *l.*
100 10 : 7 : : 30

7
100 10)210(2 *l.* 1 *s.* 9¼ *d.*
201 *s.* *d.*
9 0 0
5 0 6
3 19 6
3 15 4½
4 1½
2 1 0 5/10
2 0 ¼ 5/10

l. *s.* *d.* *qr.* *s.* *d.* *qr.*
Anſw. 2 1 9 1 2 0 1 5/10
100 10 0

The Proof by the common Way.

l. *s.* *l.* *l.*
100 10 : 7 : : 30
20 20
2010 600
7
2010)4200(2 *l.*
402
18
20
201)360(1 *s.*
201
159
12
201)1908(9 *d.*
1809
99
4
201)396(1 *qr.*
201
195

Anſw. 2 *l.* 1 *s.* 9 *d.* 1 *qr.* 195/201.

2. By Vulgar Fractions.

$$l. \quad l. \quad l.$$
$$100\tfrac{1}{2} : 7 :: 30$$
$$\tfrac{7}{1} \times \tfrac{30}{1} = \tfrac{210}{1}$$
$$100\tfrac{1}{2} = \tfrac{201}{2}$$
$$\tfrac{201}{2})\tfrac{210}{1}(\tfrac{420}{201}$$

201)420(2 *l.*
402

18
20

201)360(1 *s.*
201

159 *&c.* as before.

3. By Decimals.

l. *l.* *l.*
100.5 : 7 :: 30
7

100.5)210.0000000(2.0895522+
2010

9000
8040

9600
9040

5550
5025

5250
5025

2250
2010

2400
2010

390

Again.

l. 2.0895522
20

s. 1.7910440
12

d. 9.4925280
4

qr. 1.970112

If

If the Fraction, *viz.* $\frac{195}{201}$, at the Bottom of the firſt Way of proving the Queſtion, be reduced to a Decimal, it will appear to be the ſame as above nearly, *viz.*

201)195.0(.9701 *near enough.*
1809
1410
1407
300
201
99

But ſome Readers may yet be at a Loſs to account for the Numbers which are placed Fractionwiſe at the End of the Anſwer, and therefore not be able to reconcile $\frac{2s.\ 0d.\ 1qr.\ \frac{5}{10}}{100\ 10\ 0}$ with the Fraction $\frac{195}{201}$, which is nevertheleſs the ſame in Value exactly, as appears by the following ſhort Operation.

1. 2*s.* 0*d.* 1*qr.* $\frac{5}{10}$ = 97.5 *qrs.*
2. 100*l.* 10*s.* = 100.5*l.*
3. $\frac{97.5}{100.5}$ being multiplied by one common Multiplier, as 2 will be = $\frac{195}{201}$.

2. A Tradeſman in a particular Branch of Buſineſs, having in one Week received 121*l.* 17*s.* 6*d.* found, upon Examination, that 48*l.* 13*s.* of that Sum was clear Gain; what was the Gain *per Cent.*?

l.	*s.*	*d.*
121	17	6
48	13	0
73	4	6

l. *s.* *d.* : *l.* *s.* : : *l.*
73 4 6 : 48 13 : : 100
l. *s.* *d.* 100 *l.* *s.* *d.*

73 4 6)4865 0(66 8 9 $\frac{1}{4}$
4393 10
471 10
439 7 *d.* *qr.*
32 3 0 0
29 5 9 2 $\frac{4}{10}$
2 17 2 1 $\frac{6}{10}$
2 14 11 0 $\frac{1}{10}$
2 3 1 $\frac{5}{10}$
1 6 1 $\frac{2}{10}$ $\frac{6}{24}$
9 0 $\frac{2}{10}$ $\frac{18}{24}$

Anſw. 66 8 9 1 *l.* *s.* *d.* *qr.*

73 4 6 | 9 0 $\frac{2}{10}$ $\frac{18}{24}$ *d.* *qr.* = $\frac{36.2}{73.5}$ = $\frac{12}{25}$.

1. Proof by common Arithmetic.

l.	*s.*	*d.*	*l.*	*s.*	*l.*
73	4	6 :	48	13 : :	100
20			20		20
1464			973		2000
12					12
17574					24000
					973
					72
					168
					216
					210

17574)23352000(13218

17574

66 8 $9\frac{1}{4}$ +

57780
52722

50580
35148

154320
140592

13728
12

17574)164736(9
158166

6570
4

17574)26280(1
17574

8706

	l.	*s.*	*d.*	*qr.*
Answ.	66	8	9	1 $\frac{8706}{17574}$.

2. By

2. By Vulgar Fractions.

l. *l.* *l.*
$73\ \frac{9}{40} : 48\ \frac{13}{20} :: 100$

$48\ \frac{13}{20} = \frac{973}{20}$

$\frac{973}{20} \times \frac{100}{1} = \frac{97300}{20}$

$73\ \frac{9}{40} = \frac{2929}{40}$

$\frac{2929}{40})\frac{97300}{20}(\frac{3892000}{58580}$

585810)38920010(66 *l.*
35148

37720
35148

2572
20

5858)51440(8 *s.*
46864

4576
12

5858)54912(9 *d.*
52722

2190
4

5858)8760(1 *qr.*
5858

2902

l.	*s.*	*d.*	*qr.*
Answ. 66	8	9	1 $\frac{2902}{5858}$

3. By Decimals.

l. *l.* *l.*
73.225 : 48.65 : : 100
100

73.225)4865.000(66.43905769
439350

471500
439350

321500
292900

286000
219675

663250
659025

422500
366125

563750
512575

511750
439350

724000
659025

64975

Again.

l. 66.43905769
20

s. 8.7811538
12

d. 9.3738456
4

qr. 1.4953824

l. *s.* *d.* *qr.*
Answ. 66 8 9 1.4953

Note, *The Fractions are all equal to each other.*

A Merchant being indebted to *A* 40*l.* 12*s.* 6*d.* to *B* 70*l.* 8*s.* 10*d.* to *C* 84*l.* 19*s.* 4*d.* and to *D* 178*l.* 18*s.* 6*d.* $\frac{1}{2}$, compounds with them for 12*s.* in the Pound; how much must each Person receive?

l.	*s.*		*l.*	*s.*	*d.*		
1	12	::	40	12	6		
				12			
			24	0	0		
				7	2	1	$\frac{6}{10}$
					3	2	$\frac{4}{10}$
			24	7	6	*for* A.	

l.	*s.*		*l.*	*s.*	*d.*		
1	12	::	70	8	10		
				12			
			42	0	0		
				4	9	2	$\frac{4}{10}$
					6		
			42	5	3	2 $\frac{4}{10}$	*for* B.

l.	*s.*		*l.*	*s.*	*d.*		
1	12	::	84	19	4		
				12			
			50	8	0		
				11	3		
					1	3	$\frac{2}{10}$
					2	1	$\frac{6}{10}$
			50	19	7	0 $\frac{8}{10}$	*for* C.

l.	*s.*		*l.*	*s.*	*d.*		
1	12	::	178	18	$6\frac{1}{2}$		
				12			
			106	16	0		
				10	9	2	$\frac{4}{10}$
					3	2	$\frac{4}{10}$
						1	$\frac{2}{10}$
			107	7	1	$\frac{1}{2}$	*for* D.

Proof by the common Way.

l. *s.* *l.* *s.* *d.*
1 : 12 : : 40 12 6

20

812
12

9750
12

2lo *l.* *s.* *d.*

2410)1170010(4817(24 7 6
96

210
192

180
168

12
12

24)144(6
144

l. *s.* *d.*
Answ. 24 7 6 *for* A.

Note, *Division is made by* 240, *because* 240 *d. are equal to* 1*l.*

By Practice.

l. *s.* *d.*
40 12 6 at 12 *per l.*

s.		*l.* *s.* *d.*
10	½	20 6 3
2	⅓	4 1 3
		24 7 6

By Decimals.

40.625
.6

l. 24.3570
20

s. 7.500
12

d. 6.0

l. *s.* *l.* *s.* *d.*
1 : 12 : : 70 8 10

20
1408
12
16906
12 210 *l.* *s.* *d.* *qrs.*
2410)202872(8415(42 5 3 2 $\frac{96}{240}$.
192
108
96
127
120
72
12
2410)8614(3 *d.*
72
144
4
2410)5716(2 *qrs.*
48
96

Answ. 42 *l.* 5 *s.* 3 *d.* 2 *qrs.* $\frac{96}{240}$ *for* B.

By Practice.

		l.	*s.*	*d.*		*l.*
10	$\frac{1}{2}$	70	8	10	at	12 *per l.*
2	$\frac{1}{5}$	35	4	5		
		7	0	10	$\frac{1}{2}$	$\frac{2}{5}$
		42	5	3	$\frac{1}{2}$	$\frac{2}{5}$ *or* $\frac{4}{10}$

By Decimals.

70.441666+
.6

l. 42.2649996
20

s. 5.2999920
12

d. 3.599904
4

qrs. 2.399616

Note, *The first Decimal* Fraction *above, being a little imperfect (which is the Decimal of a l. equivalent to* 8 *s.* 10 *d.) is the Reason why the* Decimal .399+ *is short of* .4

l. *s.* *l.* *s.* *d.*
1 : 12 : : 84 19 4
20
1699
12
20392
12
2410 *l.* *s.* *d.*
2410)2447014(101|9(50 19 7.2
24
47
24
230
216
144
12
2410)17218(7 *d.* $\frac{48}{240} = \frac{2}{10}$ *or* .2
168
48

Answ. 50 *l.* 19 *s.* 7.2 *d. for* C.

By Practice.

l. *s.* *d.* *s.*
10 | $\frac{1}{2}$ | 84 19 4 at 12 *per l.*
2 | $\frac{1}{5}$ | 42 9 8
8 9 11 0.8
50 19 7 c.8

By Decimals.

84.9666+
.6
l. 50.97996
20
s. 19.5992
12
d. 7.1904

Note, *The first* Decimal *being a little defective is the Reason why the last is not quite* .2, *though very near it.*

l.	*s.*		*l.*	*s.*	*d.*
1	12	: :	178	18	$6\frac{1}{2}$

20

3578

12

42942

4

171770

12

9610)2061240(21417(107 7 $1\frac{1}{2}$

192

141

96

452

384

684

672

12

12

96)144(1 *D.*

96

48

4

96)192(2 *qrs.*

192

0

Answ. 107 *l.* 7 *s.* 1 *d.* $\frac{1}{2}$ *for* D.

By Practice.

		l.	*s.*	*d.*		*s.*
10	$\frac{1}{2}$	178	18	$6\frac{1}{2}$	at 12 *per l.*	
2	$\frac{1}{5}$	89	9	$3\frac{1}{4}$		
		17	17	$10\frac{1}{4}$		
		107	7	$1\frac{1}{2}$		

By Decimals.

178.927+

.6

l. 107.3562

20

s. 7.1240

12

1.488

4

qr. 1.952

Note, *The first* Decimal *being not exact, occasions the last to be a little defective also.*

4. My Factor ſends me Word, that he has bought Goods, upon my Account, to the Value of 517 *l.* 18 *s.*: 9 *d.* what does his Commiſſion come to, at $2\frac{1}{4}$ *per Cent.*?

l.	*l.*	*s.*	*l.*	*s.*	*d.*
100 :	2	5 : :	517	18	9
			2	5	
			1035	17	6
			129	5	0
				4	6
					$2\frac{1}{4}$

	l.	*s.*	*d.*
100) 1165	7	$2\frac{1}{4}$ (	11 13 $0\frac{3}{4}$.
1000			
165			
100			
65	7		
65	0		
	7		$2\frac{1}{4}$
	6		3
			$11\frac{1}{4}$

Anſw. 11 *l.* 13 *s.* 0 *d.* $\frac{3}{4}$ 0 *l.* 0 *s.* 11 *d.* $\frac{1}{4}$ / 100 0 0

PROOF.

1. By whole Numbers.

		l.	*s.*	*d.*
5	$\frac{1}{4}$	517	18	9
				2
		1035	17	6
		129	9	$8\frac{1}{4}$
	l.	1165	7	$2\frac{1}{4}$
		20		
	s.	23307		
		12		
	d.	0186		
		4		
	qrs.	3145		

Anſw. 11 *l.* 13 *s.* 0 *d.* 3 *qrs.* $\frac{45}{100}$.

Or thus.

l. *l.* *s.* *l.* *s.* *d.*

100 : 2 5 : : 517 18 9

240 20 20

24000 40 10358

12

124305

45

621525

497220

210 *l.* *s.* *a.*

24|000)55931725(2313(11 13 0¾

48

79

72

73

72

1725

12

20700

4

24|000)821800(3

72

10800

Answ. 11 *l.* 13 *s.* 0 *d.* ¾ $\frac{108}{240}=\frac{45}{100}$.

12)$\frac{108}{240}$($\frac{9}{20}$ & $\frac{9}{20}\times 5=\frac{45}{100}$.

2. By Vulgar Fractions.

l. *l.* *l.*

100 : $2\frac{5}{20}$: : $517\frac{225}{240}$

$2\frac{5}{20}=\frac{45}{20}$

$517\frac{225}{240}=\frac{124305}{240}$

$\frac{45}{20}\times\frac{124305}{240}=\frac{55937225}{4800}$

$\frac{100}{1}$)$\frac{55937225}{4800}$($\frac{55937225}{480000}$

4810000)55913725(11 *l.*
48

79
48

313725
20

4810000)6271450(13 *s.*
48

147
144

345
12

4140
4

48100)16560(3 *qrs.*
144

216

Answ. 11 *l.* 13 *s.* 0 *d.* $\frac{3}{4}\frac{216}{480}$.

3. By Decimals.

l. *l.* *l.*
100 : 2.25 : : 517.9375
2.25

25896875
10358750
10358750
---
l. 11.65359375
20
---
s. 13.07187500
12
---
d. 0.862500
4
---
qrs. 3.4500

Answ. 11 *l.* 13 *s.* 0 *d.* 3.45 *qrs.*

5. A Tradeſman ſtands indebted to ſeveral Perſons, as follows, *viz.* to *A* 50*l.* 17*s.* 6*d.* to *B* 119*l.* 14*s.* 8*d.* to *C* 401*l.* 10*s.* 6*d.* and to *D* 141*l.* 19*s.* Now, as his whole Eſtate amounts to no more than 327*l.* 15*s.* 10*d.* $\frac{1}{2}$, how muſt it be divided among his Creditors, that each Man may have a Share in Proportion to the Debt due to him?

	l.	*s.*	*d.*
A- -	50	17	6
B- -	119	14	8
C- -	401	10	6
D- -	141	19	0
	714	1	8

l.	*s.*	*d.*	*l.*	*s.*	*d.*		*l.*	*s.*	*d.*
714	1	8 :	327	15	10$\frac{1}{2}$	: :	50	17	6

50 17 6

By 50*l.*	16389	13	9	
	277	19	0	
By 17*s.*		12	9	
		8	$\frac{1}{2}$	
			$\frac{1}{4}$	$\frac{7}{10}$
	8	3	6	
By 6*d.*			4	$\frac{1}{2}$
			$\frac{1}{4}$	0 $\frac{48}{96}$

l.	*s.*	*d.*						*l.*	*s.*	*d.*
714	1	8)	16676	10	1	$\frac{1}{2}$	$\frac{7}{10}$ $\frac{48}{96}$ (	23	7	0$\frac{3}{4}$
			14281	13	4					
			2394	16	9					
			2142	5	0					
			252	11	9					
			249	18	7					
			2	13	2	$\frac{1}{2}$	$\frac{7}{10}$ $\frac{48}{96}$			
			2	4	7	$\frac{1}{2}$	$\frac{2}{10}$ $\frac{48}{96}$			
				8	7	0	$\frac{5}{10}$			

Anſw. 23*l.* 7*s.* 0*d.* $\frac{3}{4}$ $\frac{0\,l.\ 8\,s.\ 7\,d.\ 0\,qrs.\ \frac{5}{10}}{714\quad 1\quad 8}$ *for A.*

l.	*s.*	*d.*	*l.*	*s.*	*d.*		*l.*	*s.*	*d.*
714	1	8 :	327	15	$10\frac{1}{2}$	: :	119	14	8

119 14 8

By 119 *l.* 39007 9 1 $\frac{1}{2}$

By 14 *s.* 228 18 0
10 6
7
0 $\frac{1}{4}$ $\frac{4}{10}$

By 8 *d.* 10 18 0
6
0 $\frac{1}{4}$ $\frac{3}{10}$ $\frac{8}{24}$ $\frac{16}{24}$

l.	*s.*	*d.*							*l.*	*s.*	*d.*
714	1	8)	39247	16	9	0	$\frac{8}{10}$	(	54	19	3
			35704	3	4						
			3543	13	5						
			2856	6	8						
			687	6	9						
			678	7	7						
			8	19	2	0	$\frac{8}{10}$				
			8	18	6	$\frac{1}{4}$					
					7	$\frac{3}{4}$	$\frac{8}{10}$				

l.	*s.*	*d.*		*l.*	*s.*	*d.*		
Answ. 54	19	3		0	0	7	$\frac{3}{4}$	$\frac{8}{10}$
			714	1	8			*for* B.

l.	s.	d.	l.	s.	d.		l.	s.	d.
714	1	8 :	327	15	10½	: :	401	10	6
			401	10	6				

By 401 *l.* 131445 5 10 ½

By 10 *s.* { 163 10 0 ; 7 6 ; 5 ; 0 ¼

By 6 *d.* { 8 3 6 ; 4 ½ ; 0 ¼ ; 0 0 12/24

l.	s.	d.								l.	s.	d.
714	1	8)	131617	7	8	⅛	0	12/24	(	184	6	3¾
			71408	6	8							
			60209	1	0							
			57126	13	4							
			3082	7	8							
			2856	6	8							
			226	1	0							
			214	4	6							
			11	16	6	½						
			8	18	6	¼						
			2	18	0	¼	0	12/24				
			2	4	7	½	2/10	12/24				
				13	4	½	8/10					

	l.	s.	d.				
		0	13	4	½	8/10	
Answ.	184	6	3¾	714	1	8	*for* C.

l.	s.	d.	l.	s.	d.		l.	s.
714	1	8	: 327	15	$10\frac{1}{2}$	: :	141	19
			141	19				

By 141 *l.* 46218 18 $4\frac{1}{2}$
310 13
14 3
By 19 *s.* 9 $\frac{1}{2}$
$\frac{1}{4}$ $\frac{9}{10}$

l.	s.	d.						l.	s.	d.
714	1	8)	46530	6	5	$\frac{1}{4}$	$\frac{9}{10}$	(65	3	$2\frac{1}{2}$
			42825							
			3685	6	5					
			3570	8	4					
			114	18	1					
			107	2	3					
			7	15	10	$\frac{1}{4}$	$\frac{9}{10}$			
			5	19	0	0	$\frac{6}{10}$ $\frac{4}{6}$			
			1	16	10	$\frac{1}{4}$	$\frac{2}{10}$ $\frac{2}{6}$			
			1	9	9	0	$\frac{1}{10}$ $\frac{4}{6}$			
				7	1	$\frac{1}{4}$	0 $\frac{4}{6}$			

	l.	s.	d.
Answ.	65	3	$2\frac{1}{2}$

l.	s.	d.				
0	7	1	$\frac{1}{4}$	0	$\frac{4}{6}$	*for* D.
714	1	8				

	l.	s.	d.
A	23	7	$0\frac{3}{4}$
B	54	19	3
C	184	6	$3\frac{3}{4}$
D	65	3	$2\frac{1}{2}$
Remainder			$\frac{1}{2}$
	327	15	$10\frac{1}{2}$

Remainders.

l.	s.	d.	qr.	
0	8	7	0	$\frac{5}{10}$
0	0	7	3	$\frac{8}{10}$
0	13	4	2	$\frac{8}{10}$
0	7	1	1	0 $\frac{4}{6}$

l.	s.	d.						
714	1	8)	1	9	9	0	$\frac{1}{10}$ $\frac{4}{6}$	(2qrs
			1	9	9	0	$\frac{1}{10}$ $\frac{4}{6}$	
							0	

The Proof by common Arithmetic.

l.	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*
714	1	8 :	327	15	$10\frac{1}{2}$: :	50	17	6
20			20			20		
14281			6555			1017		
12			12			12		
171380			78670			12210		
			4			314682		
			314682			24420		
						97680		
						73260		
						48840		
						12210		
						36330		
								4

171380)384226722lo(22419 3

34276

41466

34276

71907

68552

33552

17138

164142

154242

99000

12)5604

2lo)4617

£23 7 $0\frac{1}{2}$

A

l.	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*s.*	*d.*
714	1	8 :	327	15	$10\frac{1}{2}$: :	119	14	8

20 20 20

14281 6555 2394

12 12 12

171380 78670 28736

4 314682

314682 57472

229888

172416

114944

28736

86208

4

171380)904270195|2(52764

85690

12)13191 3

47370

34276 210)10919

130941 £54 19 3

119966

109759

102828

69315

68552

7632

B

l.	*s.*	*d.*	*l.*	*s.*	*d.*		*l.*	*s.*	*d.*
714	1	8	: 327	15	$10\frac{1}{2}$	: :	401	10	6
20			20				20		
14281			6555				8030		
12			12				12		
171380			78670				96366		
			4				314682		
			314682				192732		
							770928		
							578196		
							385464		
							96366		
							289098		
									4
							1713810)3032464561		12(176943 3
							17138		
							131866		12)44235 3
							119966		210)36816
							119004		£184 6 $3\frac{3}{4}$
							102828		
							161765		
							154242		
							75236		
							68552		
							66841		
							51414		
							154272		

l.	*s.*	*d.*	*l.*	*s.*	*d.*		*l.*	*s.*
714	1	8	327	15	$10\frac{1}{2}$	::	141	19
20			20				20	
14281			6555				2839	
12			12				12	
171380			78670				34068	
			4				314682	
			314682				68136	
							272544	
							204408	
							136272	
							34068	
							102204	
								4

171380)10720586371 6(62554 2

102828

43778
34276

95026
85690

93363
85690

76737
68552

81856

12)15638 2

210)13013

£65 3 $2\frac{1}{2}$

D

		l.	*s.*	*d.*
Answ.	A	23	7	$0\frac{3}{4}$
	B	54	19	3
	C	184	6	$3\frac{3}{4}$
	D	65	3	$2\frac{1}{2}$
	Remainder			$\frac{1}{2}$
		£327	15	$10\frac{1}{2}$

Remainders.

99000
7632
154272
81856

171380)342760(2 *qrs.*
342760
0

6. Five Merchants traded together: *A* put into the common Stock 721*l.* 14*s.* 6*d.* $\frac{1}{2}$, for 11 Months; *B* put in 400*l.* 12*s.* 8*d.* $\frac{3}{4}$, for 17 Months; *C* put in 326*l.* 12*s.* 5*d.* $\frac{1}{4}$, for 18 Months; *D* put in 536*l.* 14*s.* 9*d.* $\frac{1}{2}$, for 13 Months; and *E* put in 239*l.* 17*s.* 4*d.* $\frac{1}{2}$. for 15 Months; now the whole Gain being 987*l.* 16*s.* 5*d.* $\frac{3}{4}$, how much was due to each Trader?

By the Parts of 17.

	l.	*s.*	*d.*	
A	721	14	6	$\frac{1}{2}$
			11	
	7938	19	11	$\frac{1}{2}$
B	400	12	8	$\frac{3}{4}$
			4	
	1602	10	11	
			4	
	6410	3	8	
	+400	12	8	$\frac{3}{4}$
	6810	16	4	$\frac{3}{4}$

By the Parts of 18.

	l.	*s.*	*d.*	
C	326	12	5	$\frac{1}{4}$
			6	
	1959	14	7	$\frac{1}{2}$
			3	
	5879	3	10	$\frac{1}{2}$

By the Parts of 13.

	l.	*s.*	*a.*	
D	536	14	9	$\frac{1}{2}$
			4	
	2146	19	2	
			3	
	6440	17	6	
	+536	14	9	$\frac{1}{2}$
	6977	12	3	$\frac{1}{2}$

By the Parts of 15.

	l.	*s.*	*d.*	
E	239	17	4	$\frac{1}{2}$
			5	
	1199	6	10	$\frac{1}{2}$
			3	
	3598	0	7	$\frac{1}{2}$

	l.	*s.*	*d.*	
A	7938	19	11	$\frac{1}{2}$
B	6810	16	4	$\frac{3}{4}$
C	5879	3	10	$\frac{1}{2}$
D	6977	12	3	$\frac{1}{2}$
E	3598	0	7	$\frac{1}{2}$
	31204	13	1	$\frac{3}{4}$

l.	*s.*	*d.*		*l.*	*s.*	*d.*		*l.*	*s.*	*d.*
31204	13	$1\frac{3}{4}$	:	987	16	$5\frac{3}{4}$	: :	7938	19	$11\frac{1}{2}$
				7938	19	$11\frac{1}{2}$				

l. *l.*
$987 \times 7938 =$ 7896, 2961, 8883, 6909

7938 *l.* × 16 *s.*	–	6350	8	0			
—— × 5 *d.*	– –	165	7	6			
—— × 3 *qrs.*	–	24	16	1	2		
987 *l.* × 19 *s.*	– –	937	13	0	0		
—— × 11 *d.*	– –	45	4	9	0		
—— × 2 *qrs.*	–	2	1	1	2		
16 *s.* × 19 *s.*	– – –	15	2	1	$\frac{6}{10}$		
—— × 11 *d.*	– – –	–	8	3	$\frac{2}{10}$		
—— × 2 *qrs.*	– – –			1	$\frac{6}{10}$		
19 *s.* × 5 *d.*	– – –	–	4	3			
—— × 3 *qrs.*	– – –	–	–	2	$\frac{8}{10}$	$\frac{1}{2} = \frac{48}{96}$	
5 *d.* × 11 *d.*	– – –	–	–	–	$\frac{9}{10}$	$\frac{1}{6} = \frac{16}{96}$	
—— × 2 *qrs.*	– – –	–	–	–	–	$\frac{10}{24} = \frac{40}{96}$	
11 *d.* × 3 *qrs.*	– – –	–	–	–	$\frac{1}{10}$	$\frac{9}{24} = \frac{36}{96}$	
3 × 2 *qrs.*	– – –	–	–	–	–	–	$\frac{6}{96}$
	£7842332	6	11	1	$\frac{3}{10}$		$\frac{50}{96}$

l.	*s.*	*d.*	*l.*	*s.*	*d.*	*qr.*			*l.*	*s.*	*d.*
31204	13	$1\frac{3}{4}$	7842332	6	11	1	$\frac{3}{10}$	$\frac{50}{96}$	(251	6	$4\frac{1}{2}$
			6240931	9	2						
			1601400	17	9	1					
			1560232	17	3	2					
			41168	0	5	3					
			31204	13	1	3					
			9963	7	4	0	$\frac{3}{10}$				
			9361	7	11	1	$\frac{3}{10}$				
			601	19	4	3	0	$\frac{50}{96}$			
			520	1	6	2	$\frac{5}{10}$	$\frac{16}{96}$			
			81	17	10	0	$\frac{5}{10}$	$\frac{14}{96}$			
			65	0	2	1	$\frac{3}{10}$	$\frac{14}{96}$			
			16	17	7	3	$\frac{2}{10}$	$\frac{20}{96}$			

	l.	*s.*	*d.*	*l.*	*s.*	*d.*	*qr.*		
Answ.	251	6	$4\frac{1}{2}$	16	17	7	3	$\frac{2}{10}$	$\frac{20}{96}$
				31204	13	1	3		

for A.

l.	*s.*	*d.*	*l.*	*s.*	*d.*		*l.*	*s.*	*d.*
31204	13	$1\frac{3}{4}$:	987	16	$5\frac{3}{4}$	: :	6810	16	$4\frac{3}{4}$
			6810	16	$4\frac{3}{4}$				

987 × 6810 { 9870, 7896, 5922

6810 *l.* × 16 *s.*	–	–	5448						
—— × 5 *d.*	–		141	17	6				
—— × 3 *qrs.*	–		21	5	2	2			
987 *l.* × 16 *s.*	–	–	789	12	0	0			
—— × 4 *d.*	–	–	16	9	0	0			
—— × 3 *qrs.*	–		3	1	8	1			
16 *s.* × 16 *s.*	–	–		12	9	2	$\frac{4}{10}$		
—— × 4 *d.*	–	–	–	–	3	0	$\frac{8}{10}$		
—— × 3 *qrs.*	–	–	–	–		2	$\frac{4}{10}$		
16 *s.* × 5 *d.*	–	–	–	–	4	0			
—— × 3 *qrs.*	–	–	–	–		2	$\frac{4}{10}$		
5 *d.* × 4 *d.*	–	–	–	–	–		$\frac{3}{10}$	$\frac{2}{6}$ = $\frac{8}{24}$ = $\frac{32}{96}$	
—— × 3 *qrs.*	–	–	–	–	–	–	–	$\frac{15}{24}$ = $\frac{60}{96}$	
4 *d.* × 3 *qrs.*	–	–	–	–	–	–	–	$\frac{12}{24}$ = $\frac{48}{96}$	
3 *qrs* × 3 *qrs.*	–	–	–	–	–	–	–	–	$\frac{9}{96}$
£6727890	19	3	3	$\frac{4}{10}$					$\frac{53}{96}$

l.	*s.*	*d.*	*l.*	*s.*	*d.*	*qr.*			*l.*	*s.*	*d.*
31204	13	$1\frac{3}{4}$)	6727890	19	3	3	$\frac{4}{10}$	$\frac{53}{96}$ (	215	12	$1\frac{1}{4}$
			6240931	9	2						
			486959	10	1	3					
			312046	11	5	2					
			174912	18	8	1					
			156023	5	8	3					
			18889	12	11	2	$\frac{4}{10}$				
			18722	15	10	2	$\frac{6}{10}$				
			166	17	0	3	$\frac{8}{10}$	$\frac{53}{96}$			
			130	0	4	2	$\frac{6}{10}$	$\frac{28}{96}$			
			36	16	8	1	$\frac{2}{10}$	$\frac{25}{96}$			
			32	10	1	0	$\frac{6}{10}$	$\frac{53}{96}$			
			4	6	7	0	$\frac{5}{10}$	$\frac{66}{96}$			

	l.	*s.*	*d.*	*qrs.*		
	4	6	7	0	$\frac{5}{10}$	$\frac{66}{96}$
31204	13	1	$\frac{3}{4}$			

Answ. 215 12 $1\frac{1}{4}$ *for* B.

l.	*s.*	*d.*	*l.*	*s.*	*d.*		*l.*	*s.*	*d.*
31204	13	$1\frac{3}{4}$:	987	16	$5\frac{3}{4}$	: :	5879	3	$10\frac{1}{2}$
			5879	3	$10\frac{1}{2}$				

				8883						
l.	*l.*			6909						
987 ×	5879			7896						
				4935						
—— ×	3 *s.*	=	=	148	1	0				
—— ×	10 *d.*	=	=	41	2	6				
—— ×	2 *qrs.*	=	=	2	1	1	2			
5879 *l.* ×	16 *s.*	=	=	4703	4	0	0			
—— ×	5 *d.*	=	=	122	9	7	0			
—— ×	3 *qrs.*	=	=	18	7	5	1			
16 *s.* ×	3 *s.*	=	=	=	2	4	3	$\frac{2}{10}$		
—— ×	10 *d.*	=	=	=	=	8	0			
—— ×	2 *qrs.*	=	=	=	=	=	1	$\frac{6}{10}$		
3 *s.* ×	5 *d.*	=	=	=	=	=	3			
—— ×	3 *qrs.*	=	=	=	=	=		$\frac{4}{10}$	$\frac{3}{6} = \frac{12}{24} = \frac{48}{96}$	
5 *d.* ×	10 *d.*	=	=	=	=	=		$\frac{8}{10}$	$\frac{2}{6} = \frac{8}{24} = \frac{32}{96}$	
—— ×	2 *qrs.*	=	=	=	=	=	=	=	=	$\frac{10}{24} = \frac{40}{96}$
10 *d.* ×	3 *qrs.*	=	=	=	=	=		$\frac{1}{10}$		$\frac{6}{24} = \frac{24}{96}$
3 *qrs.* ×	2 *qrs.*	=	=	=	=	=	=	=	=	$\frac{6}{96}$
		£	5807608	8	10	0	$\frac{2}{10}$			$\frac{54}{96}$

l.	*s.*	*d.*		*l.*	*s.*	*d.*	*qrs.*			*l.*	*s.*	*d.*
31204	13	$1\frac{3}{4}$	)	5807608	8	10	0	$\frac{2}{10}$	$\frac{54}{96}$	(186	2	3
				3120465	14	7						
				2687142	14	3						
				2496372	11	8						
				190770	2	7	0					
				187227	18	10	2					
				3542	3	8	2	$\frac{2}{10}$				
				3120	9	3	3	$\frac{1}{10}$				
				422	14	4	3	$\frac{1}{10}$	$\frac{54}{96}$			
				390	1	1	3	$\frac{8}{10}$	$\frac{84}{96}$			
				31	13	2	3	$\frac{2}{10}$	$\frac{66}{96}$			

	l.	*s.*	*d.*		*l.*	*s.*	*d.*	*qrs.*		
					31	13	2	3	$\frac{2}{10}$	$\frac{66}{96}$
Answ.	186	2	3							*for* C.
				31204	13	1	3			

l.	*s.*	*d.*	*l.*	*s.*	*d.*		*l.*	*s.*	*d.*
31204	13	$1\frac{3}{4}$	: 987	16	$5\frac{3}{4}$	: :	6977	12	$3\frac{1}{2}$
			6977	12	$3\frac{1}{2}$				

			6909							
l.	*l.*		6909							
987	× 6977		8883							
			5922							
——	× 12 *s.*	–	592	4						
——	× 3 *d.*	–	12	6	9					
——	× 2 *qrs.*	–	2	1	1	2				
6977 *l.*	× 16 *s.*	–	5881	12	0	0				
——	× 5 *d.*	–	145	7	1	0				
——	× 3 *qrs.*	–	21	16	0	3				
16 *s.*	× 12 *s.*	–	–	9	7	0	$\frac{8}{10}$			
——	× 3 *d.*	–	–	–	2	1	$\frac{6}{10}$			
——	× 2 *qrs.*	–	–	–	–	1	$\frac{6}{10}$			
12 *s.*	× 5 *d.*	–	–	–	3	0				
——	× 3 *qrs.*	–	–	–	–	1	$\frac{8}{10}$			
5 *d.*	× 3 *d.*	–	–	–	–	–	$\frac{2}{10}$	$\frac{3}{6}$ =	$\frac{12}{24}$ =	$\frac{48}{96}$
——	× 2 *qrs.*	–	–	–	–	–	–		$\frac{10}{24}$ =	$\frac{40}{96}$
3 *d.*	× 3 *qrs.*	–	–	–	–	–	–		$\frac{9}{24}$ =	$\frac{36}{96}$
3 *qrs.*	× 2 *qrs.*	–	–	–	–	–	–	–	–	$\frac{6}{96}$
		£	6892654	17	1	3	$\frac{1}{10}$			$\frac{34}{96}$

l.	*s.*	*d.*		*l.*	*s.*	*d.*	*qrs.*			*l.*	*s.*	*d.*
31204	13	$1\frac{3}{4}$	)	6892654	17	1	$\frac{3}{4}$	$\frac{1}{10}$	$\frac{34}{96}$	(220	17	$8\frac{1}{7}$
				6240931	9	2						
				651723	7	11						
				624093	2	11						
				27630	5	0	3	$\frac{1}{10}$	$\frac{34}{96}$			
				26523	19	2	0	$\frac{3}{10}$	$\frac{48}{96}$			
				1106	5	10	2	$\frac{7}{10}$	$\frac{82}{96}$			
				1040	3	1	1		$\frac{32}{96}$			
				66	2	9	1	$\frac{7}{10}$	$\frac{50}{96}$			
				65	0	2	1	$\frac{3}{10}$	$\frac{14}{96}$			
				1	2	7	0	$\frac{4}{10}$	$\frac{36}{96}$			

	l.	*s.*	*d.*	*l.*	*s.*	*d.*	*qrs.*			
Answ.	220	17	$8\frac{1}{2}$	1	2	7	0	$\frac{4}{10}$	$\frac{36}{96}$	*for* **D.**
				31204	13	1	3			

l.	s.	d.		l.	s.	d.		l.	s.	d.
31204	13	$1\frac{3}{4}$	:	987	16	$5\frac{3}{4}$	: :	3598	0	$7\frac{1}{2}$

3598 0 $7\frac{1}{2}$

7896
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l. l.
987 × 3598

— × 7 d. — 28 15 9
— × 2 qrs. — 2 1 1 2
3598 l. × 16 s. — 2878 8 0 0
— × 5 d. — 74 19 2 0
— × 3 qrs. — 11 4 10 2
16 s. × 7 d. — — — — 5 2 $\frac{4}{10}$
— × 2 qrs. — — — — — 1 $\frac{6}{10}$
7 d. × 5 d. — — — — — — $\frac{5}{10}$ $\frac{5}{6}$ — $\frac{20}{24}$ — $\frac{80}{96}$
— × 3 qrs. — — — — — — — — $\frac{21}{24}$ — $\frac{84}{96}$
5 d. × 2 qrs. — — — — — — — — $\frac{10}{24}$ — $\frac{40}{96}$
3 qrs. × 2 qrs. — — — — — — — — — $\frac{6}{96}$

£ 3554221 9 5 0 $\frac{7}{10}$ $\frac{18}{96}$

l.	s.	d.		l.	s.	d.	qrs.			l.	s.	d.
31204	13	$1\frac{3}{4}$	)	3554221	9	5	0	$\frac{7}{10}$	$\frac{18}{96}$	(	113	18 0

3120465 14 7

433755 14 10 0
312046 11 5 2

121709 3 4 2
93613 10 5 1

28095 3 11 1 $\frac{7}{10}$ $\frac{18}{96}$
28084 3 9 3 $\frac{9}{10}$

11 0 1 1 $\frac{8}{10}$ $\frac{18}{96}$

	l.	s.	d.		l.	s.	d.	qrs.		
Answ.	113	18	0		11	0	1	1	$\frac{8}{10}$	$\frac{18}{96}$ *for* E.

31204 13 1 3

	l.	s.	d.
A	251	6	$4\frac{1}{2}$
B	215	12	$1\frac{1}{4}$
C	186	2	3
D	220	17	$8\frac{1}{2}$
E	113	18	0
Remainder			$\frac{1}{2}$
	987	16	$5\frac{3}{4}$

Remainders.

l.	s.	d.	qrs		
16	17	7	3	$\frac{2}{10}$	$\frac{20}{96}$
4	6	7	0	$\frac{5}{10}$	$\frac{66}{96}$
31	13	2	3	$\frac{2}{10}$	$\frac{66}{96}$
1	2	7	0	$\frac{4}{10}$	$\frac{36}{96}$
11	0	1	1	$\frac{8}{10}$	$\frac{18}{96}$

	l.	s.	d.							
31204	13	$1\frac{3}{4}$	)	65	0	2	1	$\frac{3}{10}$	$\frac{14}{96}$	(2
				65	0	2	1	$\frac{3}{10}$	$\frac{14}{96}$	

0

The Proof by common Arithmetic.

	l.	s.	d.
A	721	14	$6\frac{1}{2}$
	20		
	14434		
	12		
	173214		
	4		
	692858		
	11		
	7621438		

	l.	s.	d.
B	400	12	$8\frac{3}{4}$
	20		
	8012		
	12		
	96152		
	4		
	384611		
	17		
	6538387		

	l.	s.	d.
C	326	12	$5\frac{1}{4}$
	20		
	6532		
	12		
	78389		
	4		
	313557		
	18		
	5644026		

	l.	s.	a.
D	536	14	$9\frac{1}{2}$
	20		
	10734		
	12		
	128817		
	4		
	515270		
	13		
	6698510		

	l.	s.	a.
E	239	17	$4\frac{1}{2}$
	20		
	4797		
	12		
	57568		
	4		
	230274		
	15		
	3454110		

A	7621438
B	6538387
C	5644026
D	6698510
E	3454110
	29956471

Whole Gain.

l.	s.	d.
987	16	$5\frac{3}{4}$
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£113 18

E

	l.	*s.*	*d.*
A	251	6	$4\frac{1}{2}$
B	215	12	$1\frac{1}{4}$
C	186	2	3
D	220	17	$8\frac{1}{2}$
E	113	18	0
Remainder			$\frac{1}{2}$
	£987	16	$5\frac{3}{4}$

Remainders.

15558932

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29956471)59912942(2 *qrs.*

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Miſcellaneous Arithmetic:

OR A FULL

ACCOUNT of the NEW CALENDAR, &c.

PART VI.

OBSERVATIONS on the WEATHER,

Taken from the

Reverend Mr. POINTER, and the Shepherd of *Banbury*, &c.

Whereby any Perſon may judge, near the Time, what Changes of Weather are approaching.

1. By the SUN.

1. IF the Sun, at his Riſing, looks fair and clear, it denotes a fair Day, but if yellow, red, or deadiſh, the Air is thickening; and there will be foul Weather.

2. When the Sun Beams are red and ſhort at the Riſing, Rain proceeds.

3. When Clouds or Miſts make a Circle about the Sun, by how much the greater the Circle is, by ſo much the greater will be the Tempeſt; and if there be two Circles, the Tempeſt will ſtill be the greater.

4. If the Sun ſets red, it denotes the next to be a fair Day.

5. If the Sun ſhines uncommonly warm in the Winter, it threatens Rain; and ſo much the ſooner, by how much the nearer ſuch warm Weather happens to the Winter Solſtice.

2. By

2. By the MOON.

1. If the Clouds or Miſt make a Circle about the Moon, by how much the greater the Circle is, by ſo much the greater will the Tempeſt be; and if there be two Circles the Tempeſt will ſtill be the greater.

2. When the Moon riſeth bright, and ſhines with a pure clear Colour, 'tis a Sign of fair Weather; if red, it ſignifies Wind; and if blackiſh, Rain.

3. If the Horns of the new Moon appear bright and ſharp, they denote fair Weather, but if blunt otherwiſe.

3. By the CLOUDS.

1. Clouds that are lofty, and appearing white, like Fleeces of Wool, ſcattered in the Sky, are a Sign of fair Weather.

2. Clouds appearing like Rocks or Towers, ſignify great Rain.

3. If ſmall Clouds grow bigger and bigger in an Hour or two, they ſignify a great deal of Rain.

4. If great Clouds ſeparate, waſte off, and grow ſmaller and ſmaller, this ſignifies fair Weather.

5. When Clouds riſe in the Weſt, they ſhew Rain.

6. If Clouds look red at the Sun-riſe, there will be a very great Tempeſt.

7. If the Clouds are low at the Sun-ſet, and look with a browniſh red, it ſhews Wind or Rain the ſucceeding Day.

8. If the Clouds are driven from the Sun-riſing, and paſs away to the Weſt, it is a Sign of fair Weather.

9. When the Wind has been South two or three Days, either in Summer or Harveſt, and it grows very hot, and you ſee the Clouds riſe with great white Tops like Towers, as if one were upon the Top of another, and join'd together with black on the lower Side, there will be Thunder and Rain ſuddenly.

10. When Clouds paſs in the Air pretty faſt, there is Wind aloft; and though it be not perceivable at that Time below, it will be, in all Probability, ſhortly; and ſometimes be attended with Rain. There is alſo foul Weather at Sea, in that Quarter from whence the Clouds came.

4. By the MISTS.

1. If the Miſts ariſe out of the Ponds and Rivers, and there vaniſh away (*i. e.* are either exhal'd or ſubſide) they ſignify fair Weather.

2. But

2. But if from thence they are attracted to the Tops of Hills, 'tis like there will be Rain, either the ſame Day, or commonly within two or three Days.

3. If before Sun-riſing it be a general Miſt (both on the Hills and Vales) near the full Moon, it ſignifies fair Weather.

4. But if ſuch a Miſt be in the New of the Moon, it ſignifies Rain in the Old of the Moon; and in the Old of the Moon it ſignifies Rain in the New.

5. By the WINDS.

1. It has been an Obſervation made by ſome that have been very curious Obſervers of the Weather for many Years, that in eight Years Time there is as much South and Weſt Wind, as North and Eaſt Wind; and conſequently as many wet Years as dry.

2. When the Wind turns to the North-Eaſt Point, and continues two Days without Rain, and turns not Southward the third Day, nor rains, then it is like to continue North-Eaſt for eight or nine Days without Rain, and then return into the South.

3. If the Wind turns out of the South to the North-Eaſt again, and continues in that Point without Rain for two Days, and turns not South the third Day, nor rains the third Day, it is like to continue North-Eaſt for two Months, or three for the moſt Part. The Wind will finiſh theſe Turns towards the North in three Weeks.

4. When the Wind has been in the North for two Months, or more, for the moſt Part, and comes to the South, uſually there are three or four fair Days at firſt, and then the fourth or fifth Day comes Rain, or elſe the Wind turns North, and continues dry ſtill.

5. If it returns to the South within a Day or two, without Rain, and turns Northward without Rain, and then returns to the South, the firſt or ſecond Day, as before, two or three times together after this ſort, then it is like to be in the South or South-Weſt, two or three Months together, as it was in the North before. The Winds will finiſh theſe Turns in a Fortnight.

6. The South Wind brings Warmth in the Winter, and Heat in the Summer.

7. If it be fair Weather out of the South for a Week together (which is not uſual) it is like to be a great Drought, when it has been a long Time of Rain out of the South before.

fore. Uſually the Wind turns from the North to the South quietly without Rain, but comes back again into the North ſtrong, and with Rain. The greateſt Winds which blow down Houſes and Trees, uſually come from the turning of the Wind out of the South by the Weſt into the North, which drives away Rain and clears the Air.

8. If two Clouds ariſe, with Thunder in them, the one on the one Side of you, and the other on the other, then beware and haſte for Shelter.

9. If you ſee a Cloud riſe againſt the Wind, or Side Wind, when that Cloud comes up to you, the Wind will blow the ſame Way that the Cloud came; and the ſame Rule holds good of a clear Place, when all the other Part of the Sky is equally thick except one clear Edge near the Horizon.

10. When a Shower comes ſuddenly, 'tis like to be fair Weather again in the Space of Half an Hour, or an Hour; and when the Air grows thick by Degrees, and the Sun ſhines duller and duller, till it ſhines not at all, or the Moon or the Stars by Night, then it is like to rain ſix Hours uſually.

11. If it begin to rain from the South, with a high Wind for two or three Hours, and the Wind falls, but the Rain continues, it is like to rain for twelve Hours or more, and does uſually rain till a ſtrong North Wind clears the Air. Theſe long Rains ſeldom hold above twelve Hours, or happen above once a Year.

12. If it begins to rain an Hour or two before Sun-riſing, it is like to be fair before Noon, and ſo continue that Day; but if the rain begins an Hour or two after Sun-riſing, it is like to rain all that Day, except the Rain-bow be ſeen before it Rains.

6. By the SPRING and SUMMER.

If the laſt ſeven Days of *February*, and the firſt twenty Days of *March*, be for the moſt Part rainy, the Spring and Summer Quarters are like to be ſo too; and if the aforeſaid Days ſhould be dry, the Spring and Summer Quarters are like to be dry alſo.

7. By the WINTER.

1. If the latter End of *October* and Beginning of *November*, be for the moſt Part warm and rainy, then *January* and *February* are like to be froſty and cold, except after a very dry Summer.

2. If in *October* and *November* there be Snow and Froſts, then *January* and *February* are like to be open and mild.

ÆNIGMAS

ÆNIGMAS.

I.

I Am a Friend, and Enemy,
A Bleſſing and a Curſe;
A Beauty and Deformity,
I ſave Life, but what's worſe,
Take it away; am long and ſhort
Round, ſquare, ſtraight, crooked too,
Smooth and uneven, hard and ſoft,
Both hot and cold moſt true.
In greateſt Plenty, wanted moſt;
Where uſeful, minded leaſt;
I to all Palates ſuit myſelf,
Am ſav'ry and want Taſte:
Of ſweet and ſtinking Smell I am,
Am ſtrong and weak beſide;
Able to bear the greateſt Weight,
Yet can't a ſmall Pin guide.
I Matrimony can diſſolve,
At once pleaſe and diſpleaſe;
Abſence and Preſence, both implor'd,
And give to Cook-maids Eaſe.
Me Farmers curſe, me Merchants uſe,
I Want and Plenty bring;
Both Antidote and Bane I prove,
By me Men cry and ſing.
I kiſs the faireſt Ladies Lips,
Aſſiſt them in their Dreſs;
Am often their great Ornament,
For which they my Name bleſs.
One while I am ſubſervient,
At others I o'erbear;
Both uſeful and deſtructive too,
And I for nothing care.
Death and a Med'cine I am both,
Fluid and ſolid too;
A Mountain high, a Valley deep
And num'rous Offspring ſhew:
Yet I to Children am a Foe;
By me are Wonders wrought;
A Plague to all Philoſophers;
A Theme for Poet's Thought.

The beſt of Muſic I improve,
Of Uſe in other Arts;
By me the beſt of Architects
Are valued for their Parts.

Solution.

'Tis only *Water* can do this,
Which uſeful and miſchievous is. *Water*

II. *T. D.*

AS I once walk'd the *Eſſex* Road
Near to a charming Maid's Abode,
A Creature paſs'd of ſuch odd Look,
As none ſees in Dame Nature's Book.
Three Heads, and twice as many Eyes
Although in Bulk of middling Size.
As many Eyes, ſo many Ears,
At once could have and not have Fears;
Could cry, and yet could ſhed no Tears.
It had three Backs, diſtinct and right,
Could walk, and talk, and ſcold and fight,
Could reaſon, and yet nothing know
But theſe three ſmall Words *Hey, Gee, Wo.*
Eight Legs of proper Form and good,
On th' right Side two, on th' left ſix ſtood:
Of ſuch ſurprizing Frame and Make,
You might it into Piecemeals take;
And each Part be alive and ſound,
Quite free from Pain, and free from Wound;
Then re-unite and make them one,
As in its priſtine State was done:
Intirely of female Kind,
When ſep'rate or together join'd.
Now Reader an Account me bring,
Whatwas this three-back'd, ſix-eye'd, eight-legg'd thing

Solution.

Your monſtrous *Beaſt* of middling Stature,
Not found in all the Book of Nature,
Is nothing elſe (nay, do not ſtare)
But two briſk *Girls* upon a *Mare*;
Which you might ſep'rate without Pain,
And when ſo done, unite again.

I Hold

2 Girls upon a Mare

III. *T. D.*

I Hold the Good, I hold the Bad,
Am never merry, never ſad;
One Mouth I have, oft, two or three,
At which whole Hundreds enter me;
And in my Bowels ſometimes ſtay,
Then out again they make their Way,
And this repeat twice in the Day.
When in my Body they are plac'd
(Where, by the Way, I moſt am grac'd
When greateſt Numbers in me are,
And enter me in Faith and Fear)
There's ſometimes Silence, often Noiſe,
Like Men and Women, Girls and Boys;
And now and then ſo very great,
You'd think I'd burſt at any Rate
With very Pain, yet have no Grief,
So ſtand in Need of no Relief.
Now if you can to me declare
What thing I am, and who they are
That ſometimes in my Bowels live,
You ſhall a Sugar-plumb receive.

Solution.

Church. It is a *Church*, in which twice in the Day
The People meet to hear God's Word and pray;
At whoſe Doors, whenſoe'er they enter in,
Their Duty do and then come out again.

IV. *T. D.*

AH me! they little know my Weight
Who're ign'rant of Affairs of State;
But they alone who me do wear
Can tell, I bring a deal of Care:
'Tis true, my Make and Frame is ſuch,
As cauſe Mankind to 'dmire me much,
Yet were I ſet on a weak Head,
Small as I am, ſhould cruſh it dead;
And yet ſo light, howe'er renown'd,
A Pin can bring me to the Ground.
I am the Author of much Woe,
Though nought at all I of it know.

I neither

I neither Sorrow feel, nor Joy;
Nought can me pleaſe, nought can annoy.
But I grant both; yet more of Pain
Than Pleaſure doth with me remain.
Be that as 'twill, he knows it well,
Whoſe own I am; and thence can tell,
Who e'er's the Man that does me bear,
Supports me with the utmoſt Care.

Solution.

When Kings are cloth'd in Robes of State,
It is the *Crown* which makes them great;
And whenſoever they it wear,
Are ſoon convinc'd 'tis lin'd with Care.

V.

WHEN living I the Living fed,
I bear the Living now I'm dead;
My Bulk is alſo very great:
As is my Size, ſuch is my Weight.
Beſide all this, I do declare
Five Hundred Tons within me are,
Of other Weight beſide my own,
Which is to many People known;
To all which add the Rate I move,
'Twill then a greater Wonder prove.
I paſs o'er Living with ſuch Force,
As will run down the ſwifteſt Horſe.
Nay, more; two Hundred Miles a Day
I often times do wing my Way,
(For I have Wings to help me on)
And yet, moſt ſtrange to think upon,
Great as my Weight is, and my Size
(Which nobody I think denies)
What me bears up's ſo very thin,
It can't ſupport the ſmalleſt Pin.

Solution.

A *Ship* in Bulk is very great,
And conſequently of great Weight;
'Tis made of Oak, which once did yield
Acorns for Swine before they're k..l'd.
Its Wings are *Sails*, with which't doth paſs
O'er Seas as clear as Chryſtal Glaſs,
Where living *Fiſhes* ſwim within,
And where will ſink the ſmalleſt *Pin*.

My

VI. *T. D.*

MY Head is one Way very long,
And t'other very round;
And when I ſpeak, ſo ſtrong's my Voice
'Twill drive you to the Ground.

My Tongue is longer of the two,
With which I ſometimes ſing;
And when I do it in harſh Strains.
'Twill make your two Ears ring.

But when in ſofter pleaſing Notes,
I do myſelf expreſs,
I tickle then your pleaſed Ears,
And gently them addreſs.

On one Side of my Head is plac'd,
Of ſwinging Size, an Ear;
With a long Pendant fix'd thereto,
But yet I cannot hear.

And as at firſt I formed was,
So deaf I ſtill remain;
And what you ſay, nor know, nor care,
Tell (if you can) my Name.

Solution.

A Bell

Dear *Jack*, if you'd know,
'Tis the great *Bell* of *Bow*.

VII. *T. D.*

MY Head, which is round,
Oft runs on the Ground,
When I have got ſomething to do;
And tho' I've no Feet
(Yet I ſometimes run fleet)
When I borrow two Legs to my two.

My Belly is ſquare,
Wherein ſometimes are
Such Things as many refuſe;
Yet tho' its oft empty,
It has often great Plenty
Of what Noblemen ſometimes chuſe.

But however it is,
Mens Hands I oft kiſs,
When my kind Aſſiſtance they crave;
Yet when I've ſerv'd their Turn,
At me they will ſpurn,
Nor will from a Dunghill me ſave.

Solution.

A *Wheelbarrow* for many Ends conduces; a Wheel-barrow
Sometimes for clean, but oft'ner dirty Uſes.

VIII.

WHoe'er, or what firſt gave me Birth,
Or whether born upon the Earth,
Or high in Air, it matters not,
For I am born as ſoon as got;
And what's more ſtrange (if you'll believe)
As ſoon as e'er I Life receive,
I'm then beginning to decay,
And in five Seconds die away.
So ſhort's my Life, yet of ſuch Force,
I'm quicker than the ſwifteſt Horſe;
Yet neither Feet nor Wings have I,
Wherewith to run, or help me fly;
And in my Paſſage I move on
In various Lines till Life is gone:
But in this quick and haſty Pace,
At once I all the Compaſs trace,
And fill the near ſurrounding Space,
Go backward, forward, ſideways too,
And up and down, tho' not to View;
Strange to relate, but ſtill 'tis true:
And when I die, there's nothing found,
Of me beneath or 'bove the Ground.
Now tell my Name, I ſay no more,
Whatever you of me explore.

Solution.

Sound, from what Place ſoe'er it moves, Sound
As from a Center moves in Lines direct;
Ten thouſand times ten thouſand told,
It fills ſurrounding Space in this Reſpect.
Is in its Paſſage very ſwift,
And not unfrequently is very ſtrong,
Yet ſoon as 't's born begins to die;
Its Life is ſometimes ſcarce five Seconds long.

I am

IX.

I Am the beſt of things below,
Yet often toſſed to and fro
As nothing worth; and yet declare
(Tho' variouſly I do appear)
To th' World the beſt Advice I give,
And tell Mankind how they ſhould live;
If they do well ſhall go to Heaven,
Where ev'ry Sin ſhall be forgiven;
But if th' reverſe, they then muſt dwell,
O ſad! for evermore in Hell.
Yet notwithſtanding my Advice,
Which ſome think not ſo wiſe as nice,
I'm often kick'd by Boys, and cufft,
And for my good Turns ſometimes hufft.
In many Places I am found,
And always give Advice that's ſound
But what's remarkable in me,
I know no Joy nor Miſery:
And tho' I never did amiſs,
Inſenſible of Happineſs.
I ſometimes Limb from Limb am torn,
Yet feel no Pain to make me mourn;
But ever to my greateſt Foes,
I do eternal Light diſcloſe.

God's Word

Solution.

'Tis *God*'s Word which does Sin oppoſe.

X.

WHEN Sol's bright Rays no more Men cheer
In this their upper Hemiſphere,
Then I take Place, to let them ſee
How uſeful I to them can be.
By me aſſiſted they are pleas'd,
But taken from them, vex'd and teaz'd;
The Fair oft place me near their Eyes
Without Reſerve, without diſguiſe,
And thankful for my Service are,
Which they'll at any Time declare.
Whenever I am ſtanding by,
There's Joy in ev'ry Maiden's Eye,

But

But when removed out of Sight,
On ev'ry Eye ſits diſmal Night.

Solution.

A pleaſing Sight
In Time of Night
Is *Candle-light*. } Candle-light.

XI.

BAD Tenants ſeldom pay their Rent,
They're tickliſh Chaps, on Miſchief bent.
'Tis wanton Harlots Youth beguile,
And ſtrive to kill whene'er they ſmile:
But they, who tread in Virtue's Ways,
Will ever meet with good Men's Praiſe.
Will not to Lewdneſs be confin'd;
But will in Wedlock's Charms be join'd:
From ev'ry Vice yourſelf withdraw,
And always keep the ſacred Law.
Learn Modeſty; be juſt to all;
Whether them Friends or Foes you call.
Let Goodneſs, in a Word, yours be,
You ſhall be bleſs'd eternally.
Now from theſe Lines, in artful Frame,
The Author begs you'd tell her Name:
Look narrowly, you'll ſee the better,
And then you'll quickly find each Letter.

Solution. Hannah Snellway.

Your Chriſtian-Name is *Hannah*, I can tell.
Your Sur-Name's *Snellway* too, I know it well.
I gain'd them by ſtrict Search, and found the Letters,
Tho' pretty ſtrongly bound in Leaden Fetters.

XII.

WHatever others of me think,
concerning what I eat or drink,
Yet while they waſte their Time and Store,
Tho' I've no Means, I am not poor;
Nay I am rich, for all is mine
On which the Sun or Moon does ſhine.
Truly I eat of Herbage green,
In Summer-time while it is ſeen;

And

And tho' I oft abroad do roam,
Yet evermore I am at home.
In Winter-time I am confin'd,
And then my in-door Buſineſs mind;
But ſoon as Summer comes again,
Abroad I go, but ſtill remain
At home as I before obſerv'd,
Where conſtantly my Health's preſerv'd.
Yet leſt you ſhould me diſbelieve,
Or think I want you to receive
My Notions odd, this learn withal,
That it is no Untruth at all,
For me to go abroad, yet ſtay
At home, the ſame Time all the Day.
The Reaſon's plain, which if you'd know,
I take my Houſe where'er I go.

Solution.

Tho' *Snails* for Paſturage do roam,
Yet they are evermore at home;
And never from their Houſes ſtray,
But travel with them ev'ry Day.

XIII. *T. D.*

A Covering upon my Head I wear;
No Part of Fiſh, nor Beaſt, nor Fowl, nor Hair;
Nor yet of Reptile Kind I here declare.
Yet is the Produce of ſome living thing,
As Witneſſes great Number I can bring.
Tho' when of it a Particle I ſee
I call't a Hair, and with me all agree;
How's this! when ſingle we a Hair it call,
But when compounded, ſomething elſe cry all!
With this a Cov'ring for my Pate is made,
To guard 'gainſt *Hyem*'s Cold, and from *Sol*'s Heat to ſhade.

Solution.

In *India*, as ſev'ral Trav'lers know,
And *Turky* likewiſe, *Cotton Trees* do grow,
Of theſe fine Cloth is made, call'd Callico.
Of this too, *Caps* are made for you and me,
To ſave our Pates from th' Weather's Injury.

UPON

XIV.

UPON a Thing that hath no Ears,
Nor Legs, nor Eyes, ſo never hears,
Nor walks, nor ſees, I ſit aſtride,
And fearleſs without Saddle ride;
Where I two Friends do much befriend,
And when they doubt their Doubts I end.
The Sexes both alike me uſe,
Nor do I e'er my Help refuſe,
But evermore their Call obey,
Whether it be by Night or Day.
The Aged my Aſſiſtance crave,
To whom I always well behave.
The Younger ſometimes, I confeſs,
And fair ones too, do me careſs;
And place me near their pretty Eyes,
For whom, perhaps, ſome Lover dies.
But they to me no Pleaſure give,
And yet in Pain I never live.

Solution.

Ah! *Jenny*, on thy lovely Noſe,
Sits ſomething, which I will ſuppoſe
Suits well with thoſe two Friends your Eyes,
For which, though your dear *Collin* dies,
It argues ſtill a Sight that's bad,
Or *Spectacles* you'd not have had.

XV. *T. D.*

COME tell me, Sinner, who am I?
For with my Weapon you ſhall die.
Prepare to give Account with Speed,
What Sort of Life you late did lead.
How much you Violence have us'd;
And how your precious Time abus'd;
How often had more Gods than one,
When you ſhould worſhip God alone:
How often took his Name in vain,
And did too oft his Day prophane.
Your Parents too, have diſobey'd,
And their Hearts ake have often made,
How often ſtole what wa'n't your own,
And too too often Harlots known:

Againſt

Againſt your Neighbour Slanders born,
And from his Body his Soul torn;
Or otherwiſe him us'd amiſs,
And coveted all that was his.
I ſay prepare Account to give,
How you upon the Earth did live;
If well, 'tis well; if not 'tis bad;
And then your Lot will be moſt ſad.
Now let this ſingle Stroke of mine,
Your Soul and Body quite disjoin,
'Tis done — and now the Soul muſt go,
To endleſs Bliſs or endleſs Woe.

Solution.

Whoever lives here as he ought,
Shall dwell with *Chriſt*, who hath him bought;
And he who lives a Life in vain,
Will meet with everlaſting Pain:
In either Caſe, for Bliſs or Wo,
By *Death* Man one of them ſhall know.

XVI.

WHate'er my Bowels do contain,
They clothe the Fair, 'tis very plain;
With which they do appear each Day,
Delightful, pleaſant, blithe, and gay,
And though in *England* I am fed,
In *Italy* I'm better bred;
Becauſe my Food's more plenty there,
And they of me more careful are:
My Diet is of Leaves of Trees,
Which me from Hunger daily ſrees;
And when my Time of Eating's o'er,
I leave off quite, and ne'er eat more.
'Tis then I turn my Inſide out
For Men to tug and pull about;
This Way and that, as they ſee fit,
That they in ſhining Robes may ſit.
When this is done, I change t'a Fly,
Increaſe my Species, and then die.

Solution.

The *Silk-worm*, though of creeping Kind,
Is in its Produce none behind.
Hence from the Reptile World, we ſee
How is deriv'd our Finery.

XVII.

I Have two Bodies join'd in one,
And ſtand ſtill, when alone I run.
Strange to relate, but yet 'tis true,
At once to ſtand and run with me's not new:
But if with philoſophic Eye,
You view me, then it is that I
Declare Life's ſhort, and you muſt die.
'Tis true, when I my Race have run,
Directly 'tis again begun;
And four and twenty times a Day.
My Life begins, and wears away:
Thus by ſucceſſive Turns I live,
And by the ſame my Death receive.
But if through Careleſſneſs I fall,
'Tis then my Death comes once for all:
And tho' I've often liv'd before,
I then ſhall die ne'er to live more.

Solution.

How our frail Life is daily ſpun,
Time ſhews us as the *Hours* run
In's brittle *Glaſs*; which if deſtroy'd,
It's Life's extinct, and made quite void.

XVIII. *T. D.*

AH! what is that black thing I ſee;
I hope it is not made for me.
Hear what it ſays in ſilent Strains:
'Ye Mortals bring me your Remains:
'Go quit your Carcaſſes of Clay;
'And in my Bowels let them lay:
'In me moſt ſweet Repoſe you'll find,
'Howe'er the World may prove unkind:
'Here th' injured Man is free from Strife;
'And all the vexing Cares of Life:
'The weary'd Traveller reſts here,
'Secure from Pain, and from all Fear.
'My Aſpect may ſome Dread create;
'It will, where Men repent too late:
'But whoſoever here lives well,
'Hereafter ſhall in Heaven dwell.'
Now Reader, if this thing you've ſeen,
You ſure can tell what 'tis I mean.

Solution.

Solution.

Whenever Men depart this Life,
Their Souls directly go
To Happineſs, that knows no End;
Or elſe to endleſs Woe.
Each Body's in a *Coffin* laid,
Devoid of Pain and Grief,
And as it then can't be oppreſs'd,
It cannot want Relief.

XIX.

WHEN firſt I in this World was ſeen,
I was, as if I had not been.
No Sign of Senſe in me appear'd,
Could make no Noiſe, ſo not be heard.
To walk or ſtand could not abide,
But ever lie upon my Side;
Or roll about from Place to Place,
Yet none my Path could ever trace.
Strange it may ſeem, yet it is true,
That I had Mothers, Number two:
And both, when cloth'd in beſt Array,
Not worth Five Shillings I dare ſay.
Twice was I born, yet ſecond Birth,
Gave Date to all my ſeeming Mirth:
Seeming indeed, for you muſt know,
I all my Life in fear do go,
And from the Hand that draws the Knife,
Would gladly run to ſave my Life;
But Fate decrees I muſt be kill'd,
That her own Law may be fulfill'd:
And tho' I never Sin did know,
Yet to the Fire I muſt go.

Solution.

Your Riddle's nothing but an *Egg*,
Which rolls becauſe it wants a Leg.
It had a firſt and ſecond Mother;
An Egg by the firſt, a Chicken t'other;
And both together very dear
Of two Half Crowns, I do declare:
And when alive are good for Nought,
But beſt when to the Fire brought.

XX.

NO Fault I ever did commit,
Yet am ſeverely beat;
And whenſoever I do good,
Am treated like a Cheat.
Whenever I upright do ſtand,
'Tis then I ſleep the beſt;
And when in ſoundeſt Sleep I am,
Then I am leaſt at reſt.
In ſwifteſt Motion when I'm put,
I like a Stock ſtand ſtill;
Run when I ſtand, and ſtanding run,
To 'bey my Maſter's Will.
And when I run, ſo ſwift I am,
You cannot ſee me move;
Strange to relate, but 'tis as true,
As *Dick* ſweet *Nell* does love.

Solution.

A *Scourge Top* when 'tis faſt aſleep,
In ſwifteſt Motion then does keep;
And when with ſtrongeſt Thongs 'tis bound,
Runs conſtantly a certain Round,
At once it *ſleeps*, *runs* and *ſtands* ſtill,
And ſo obeys its Maſter's Will.

REBUSSES.

I.

WHAT's dreaded by a Man with Cares oppreſt,
And where a Beaſt enjoys his Food and Reſt;
Theſe join'd together, you muſt ſurely own,
Will make the Name of an old *Engliſh* Town.

Solution.

A *Barn* all Men diſtreſſed dread;
And Beaſts are to a *Stable* led:
And when you theſe together take,
They will the Word *Barn-ſtable* make.

II.

WHAT covers your Head, and produces your Corn,
Is the Name of a Town where my *Chloë* was born.

Solution.

Solution.

A *Hat* on my Head, and in my *Field* Corn,
Make *Hatfield*, the Town where your *Chloë* was born.

III.

BELOW my Mouth, and on my Face,
There ſomething is which has a Place;
What it is call'd, I will not tell,
Becauſe I'm ſure you know it well:
This join'd with v turn'd upſide down,
Denotes a Place of great Renown.

Solution.

It is CHIN-A, my Dear,
Where you came from laſt Year.

IV. *T. D.*

WHAT do you call it, Not to have
Life's Comforts? tell me, *Jack*, I crave.
Suppoſe to fourſcore Years I live?
What's that? a juſt Account me give.
Now if you join theſe two aright,
At any Time before 'tis Night,
They'll ſhew the Place where I muſt dine
Next *Tueſday*, and get drunk with Wine.

Solution.

He who Life's Comforts don't enjoy,
Moſt ſurely lives in *Want*;
And who to fourſcore Years arrives,
All muſt old *Age* it grant.
Now thus I theſe together join,
And tell where you'll get drunk with Wine,
At *Wantage* 'tis you filthy Swine.

V. *T. D.*

WHenever you my Pate do view,
Quite free from any Hair,
You then me ſomething call, 'tis true,
But what I'll not declare:
This join with ſomething which you drink,
'Tis either red or white,
Then the laſt Letter quite expunge,
Now tell my Name at Sight.

Solution.

The Man that is *Bald*, to be ſure has no Hair;
And he, who drinks *Wine*, ſits void of all Care:
Theſe two Words then join; and then you will ſee,
That *Baldwin* they make, by rejecting the e.

VI.

THERE is a Fowl, which I have ſeen,
Were't here, 'twould tell where I have been,
Becauſe you then would know its Name,
And ſo declare from whence I came.
It's Male is often very proud,
And then it chatters very loud:
Tho' large, no Spirit has t' engage,
A little Cock of Half its Age:
But cowardly away does run,
E'er it a Battle has begun.
I think I've ſaid enough to tell,
Where once I formerly did dwell.

Solution.

A *Turky* Cock is very proud!
And Coward like, is very loud.

VII.

THERE nothing is, as I am told,
But ſomething is before 'tis old;
And many Things that have been loſt,
Have never to the Owner's Coſt,
Been —— What d'ye call't? and brought again,
Which much increas'd the Owner's Pain.
Sailors, when they are on the Main,
And nothing them does entertain,
But Water, and ſome threat'ning Clouds,
Delight not in thoſe rough Abodes;
But eagerly, and ſometimes pant,
Look out for what they wiſh and want.
Now theſe together join and tell,
Where live my Siſters, *Sue* and *Nell*.

Solution.

'Tis *New-found-land*, your Siſters *Nell*
And *Sue* do live, I know it well.

Whatever

VIII.

WHatever's oppoſite to Light,
Is moſtly ſeen at Ten at Night:
Then Participle's three laſt Letters
Of th' preſent Tenſe, though you have Fetters,
If duly join'd you'll then diſcover
Where lives *Suſanna* my dear Lover.

Solution.

'Tis *Dark-ing* where my *Suke* does live,
I wiſh ſhe would her Heart me give.

IX.

DEATH ſomething has in's Hand depend on't,
Which has a ſharp thing at the End on't,
With which, if once he does you ſtrike,
You'll ſay, you never felt the like:
And on the Face 'tween Noſe and Chin,
There's ſomething to put ſomething in:
Now if theſe two you rightly join,
You have the Place where's ſold good Wine.

Solution.

'Tis *Dart-mouth* where good Wine is ſold,
As I have more than once been told.

X. *T. D.*

WHAT is it grows like Wheat as high?
Come tell me now, or by and by:
And what d'ye call that five barr'd Thing,
That does in Fields on Hinges ſwing?
Theſe two, when well together join'd,
Will make an inland Town you'll find.

Solution.

I think the Thing that grows as high
As Wheat, is nothing elſe but *Rye*:
And when in th' Fields a *Gate* does ſwing,
It tells me that's the other Thing:
And when I ſee theſe rightly join'd,
Of *Ryegate* then they me remind.

N. B. This is a Market Town in *Surry*, by ſome called *Reygate*.

XI. *T. D.*

A Maiden has another Name,
While ſhe, unmarried bears no blame.
And the third Vowel, People ſay,
Is —— Oh! I dare not tell to Day:
And the firſt Vowel is well known
To be —— I muſt not ſpeak I own:
But this I'll tell, nor be afraid,
They'll ſhew where good Tobacco's made,
If they're together rightly join'd,
As you, by Art may quickly find.

Solution.

A *Virgin* is another Name,
For Maidens while they're void of Blame.
I's the third Vowel, *a* the firſt;
And if they be but rightly nurſt,
They'll make *Virginia*, where you know,
The choiceſt ſmoaking Herb does grow.

XII.

A Lion lodges ſomewhere, I know well,
But what you call the Place, now I'll not tell.
Archers (mind what I ſay) or miſs or hit,
But what it is, let this employ your Wit.
Now if theſe two you join, as I am told,
They'll ſhew a Place where th' Winter's very cold.

Solution.

A Lion lodges in a *Den*,
Archers the *Mark* do hit;
And *Denmark* is the Place you mean,
Or I have loſt my Wit.

XIII.

WHERE's Silver, Gold, and Copper bred?
And where that Metal called Lead?
And what do Mankind ever wear
Upon their Shoulders? quick declare.
Theſe two join'd nicely, ſtraight will ſhew,
Where lives

Your Servant,
Richard Doe.

Solution.

Solution.

Gold, Silver, Copper, Iron, Lead,
Each in it's *Mine,* are ever bred;
And when you ſee *Dick Doe,* beware
That your *Head* your own Shoulders bear.
Now theſe two put together tell,
At *Minehead,* Dick, all Things go well.

An Epitaph.

J. O.
Hnan DJ oAnLi ebu Ri Edh ERE
W. H. owh ENal Ive
T. H.
Oug Htth EYco UL Dth Rive
W. I.
Thno Ughtb Uthu Mmin Gbe Er.

This, and the following are deſign'd for the Learner to put them into proper Words.

Matt. v. 29, 30.

I.

Fth yri gHte yeo ffe ndth eep lu ckit ou
tAN dCaS tiT fRO mth EE fO ri tiſp
R O F I
taBL efo rth EE tha Ton Eoſt hy
M. E. M.
Be Rssh Oul Dp eR IsHa NDh oTt
Hat Th Ywho Leb OdY Sho UL Dbec
Aſti Ntoh El L
A. N.
Diſt hyr ighth an Doff endth EE cu tito
FFa nd ca ſti tfro Mthe EF ori tisp RO
Fita BL efo Rth EE tha ton eoſt HY
MeMb ERss Houl D peri SHan Dno
ttha Tth Ywho Lebo Dysh Oul Dbeca
stin Tohe L. L.

The Character of a Chriſtian in *Paradoxes*.

1. A Chriſtian is one, who *believes* things, which his Reaſon cannot comprehend. Who hopes for that, which neither he nor any Man alive ever ſaw. And who *labours* for that, which he knows he can never attain.

Solution. A Chriſtian believes the *Trinity* in *Unity*, and *Unity* in *Trinity*, which his Reaſon cannot comprehend. He hopes to be received into the Kingdom of *Heaven*, which he, nor any Man alive, ever ſaw. And he labours after *Perfection*, yet knows, at the ſame Time, that he can never attain to it.

2. He believes a Virgin to have been a Mother, and her own Son to be her Maker.

Solution. This is meant only of the Virgin *Mary*, of whom our Saviour was born: and as he was God; ſo alſo was he her *Maker*.

3. A Chriſtian believes *him* to have been a weak Child, carried in Arms, who is the *Almighty*; and *him* to have died, who only hath Life and Immortality in himſelf.

Solution. Our *Saviour*, whilſt he was in the Fleſh, was that weak Child; and he, as *Man*, died upon the Croſs; but as *God*, has only Life and Immortality in himſelf.

4. He believes the God of all Grace, to have been angry with one, who never offended him; and the God that hates all Sin, to be reconciled to himſelf, though ſinning continually, and never making, or being able to make him Satisfaction.

Solution. The only begotten Son of *God* took upon him the Sins of the whole World, and endured that Wrath of *God* which was due to Mankind only for their Diſobedience: And in this Senſe it is to be underſtood that *God* was angry with his Son, who never offended him; and therefore *God* Almighty will always be reconciled to the repenting Sinner; though he is not able to make Satisfaction, ſince Chriſt did it for him.

5. He dares not juſtify himſelf, even in thoſe things wherein he knows no Fault in himſelf, yet he believes *God* accepts thoſe Services, wherein himſelf is able to find many Faults.

Solution. In the Sight of *God* no Fleſh can be juſtified; and if he *charges his Angels with Folly*, who have no Sin, how much more Man, who is nothing elſe but Sin? But yet if a Man has theſe two great Articles, *Faith* and *Repentance*, he

reſts

reſts ſatisfied that *God* will accept his weak Services, they being his beſt; though when he has offered them up, he can, by looking back, diſcover the Errors he committed at the Time that he offered them.

6. He is the moſt lowly minded, yet the greateſt Aſpirer; moſt contented, yet ever craving.

Solution. When a Chriſtian compares himſelf with *God*, if I may uſe the Expreſſion, he has great Reaſon to be lowly minded, becauſe of the immenſe Difference between them; notwithſtanding which he is the greateſt Aſpirer, becauſe he aims at things which the Heart of Man is not able to conceive for their ineſtimable Value. And inaſmuch as he puts his full Truſt in God, joined with his own beſt Endeavours to live a good Life, he is contented let what will befal him in this World. He is ever *craving*, 'tis true; but it is *Pardon* for his paſt Offences, and *Grace* to lead a new and better Life for the Time to come; both which he will petition for with the ſtrongeſt Deſire all the Days of his Life.

7. He loſes his Life and gains by it, and even while he loſes it, he ſaves it.

Solution. When a true Chriſtian departs this Life, whether it be by *Famine*, *Peſtilence*, *Fire*, or *Sword*, a natural or violent Death, he goes into the Regions of Bliſs, conſequently he muſt gain by it, becauſe the Happineſs of the World to come, is ſuperlatively greater than any this World can afford: Such a Chriſtian may alſo very juſtly be ſaid to *ſave his Life* by *loſing it*; ſince he only loſes it it in this World to *ſave it* from eternal Deſtruction, and find it in the Kingdom of Heaven. A happy Loſs.

8. He denies himſelf often; yet no Man, that moſt pleaſes himſelf, loves himſelf ſo well.

Solution. A true Chriſtian *faſts* as well as prays; and he who faſts denies himſelf; and herein he may be ſaid to love himſelf, becauſe he has Heaven in view; and not only love himſelf, but *better*, than he who pleaſes himſelf: For he, who pleaſes himſelf, looks no farther than this Life, not regarding how it ſhall fare with him in the World to come; while he, who denies himſelf here, does it to obtain a happy Eternity. And as the ſmalleſt Share of Happineſs in Heaven is infinitely larger than the greateſt upon Earth; ſo he who denies himſelf the Pleaſures of this Life to gain a better, moſt certainly loves himſelf better than he who denies himſelf nothing that this World can afford, and takes no Care to ſave his Soul.

9. He

9. He is the moſt reproached of all Men living; and yet at the ſame Time, no Man is ſo highly honoured.

Solution. The beſt Chriſtians are generally moſt reproached for their daring to be good; and this is the Work of the Devil, who endeavours to deſtroy all Goodneſs; but whenever they are thus reproached by Men, they are then moſt honoured by God for being ſo, which is the greateſt Honour.

10. The more Injury his Enemies do to him, the more Advantage he gets by them.

Solution. Becauſe, while he ſuffers for Chriſt's Sake, he is ſure to gain *Heaven* by it, which is the greateſt of all *Bleſſings*.

11. He is a Peace-Maker; yet continually fighting, and an irreconcileable Enemy.

Solution. When Men are at Variance, he will endavour to make up the Difference, and ſet them at Unity: but he himſelf is continually fighting againſt his three grand Enemies, the *Devil*, the *World*, and the *Fleſh*; and is an irreconcileable Enemy to them, leſt they ſhould overcome him and bring him to eternal Deſtruction.

12. He believes the Angels to be more excellent Creatures than himſelf, and yet counts them his Servants. He believes he receives many good Turns by their Means, yet he never prays their Aſſiſtance, nor craves their Prayers, nor offers them Thanks, which yet he doth not diſdain to do to the meaneſt Chriſtian.

Solution. The Angels are not only more excellent Creatures than Men, but miniſter alſo to their ſpiritual Wants; hence they are our Servants. And although we do receive many good Turns, by their Means, they being our conſtant Attendants, yet it is not lawful to pray to them, nor crave their Prayers; neither may we thank them for their good Offices, becauſe they are commanded of God, to whom alone our Thanks are due.

13. He knows he ſhall not be ſaved by his Works, and yet doth all the good Works that he can, and believes he ſhall not be ſaved without them.

Solution. Good Works alone will never ſave a Man; and it is as certain that without them he cannot be ſaved. *Faith* therefore muſt be joined with *Works*, and by them both, a Chriſtian ſtands a fair Chance of being made an Inheritor of the Kingdom of Heaven.

14. He prays with all his Heart not to be led into Temptation, yet rejoices when he is fallen into it.

Solution.

Solution. A Chriſtian prays that he may not be led into *Temptation*, for fear he ſhould fall therein; but when he is *tempted* and falls not by the *Temptation*, he has great Reaſon to rejoice and be thankful to God for ſupporting him under it.

15. He believes his Prayers to be heard, even when they are denied, and gives Thanks for that which he prayed againſt.

Solution. The beſt of Chriſtians are but ſhort-ſighted Creatures, and therefore cannot ſo well tell what is good for them, as he, who knows all things can; Hence allowing God to know better than themſelves, they are contented if they are denied the thing which they prayed for; imagining, if they had it, it would be worſe for them. And as Men pray againſt Afflictions of all Kinds, yet when they are ſent for our good, we ought to be thankful, and ſay with *David*, *It is good for me to be afflicted, that I may learn thy Commandments.*

16. He is a *Serpent* and a *Dove*; a *Lamb* and a *Lion*; a *Reed* and a *Cedar*.

Solution. He is as wiſe as a *Serpent* to be hurt by nobody, and as harmleſs as a *Dove* to hurt nobody himſelf: In his ſuffering for Sin, or for the Cauſe of *Chriſt*, he is as patient as a *Lamb*, but in oppoſing *Sin*, he has the Courage of a *Lion*. In the common Calamities of Life, he is like a *Reed*, frequently ſhaken, and often born almoſt quite down; but againſt the Storms and Tempeſts of *Satan* and his wicked Suggeſtions, he ſtands firm like the *Cedar*, which is not eaſily ſhaken.

17. He lives inviſibly to thoſe that ſee him; and thoſe who know him beſt, do but gueſs at him: Yet they ſometimes ſee farther into him, and judge more truly of him than he doth of himſelf.

Solution. A true Chriſtian retires frequently into himſelf, and thence too often finds juſt Reaſon to accuſe and condemn himſelf, but then it puts him upon his Guard, and makes him more watchful for the Time to come, and thus he lives *inviſibly* to all others. Hence as he declares nothing of all this to the World, they who know him beſt do but *gueſs* at him; and as the good Chriſtian has always a mean Opinion of himſelf, knowing he is not ſo good as he ought to be, and is rather inclined to condemn than acquit himſelf: So they who are beſt acquainted with him, and know that he has led as good a Life as human Frailty would admit of, always and with good Reaſon acquit him; and hence it may very juſtly

juſtly be ſaid, that *they ſometimes ſee further into him, and judge more truly of him, than he doth of himſelf.*

18. He believes in one *Nature three Perſons,* and in one *Perſon two Natures.*

Solution. God the *Father,* God the *Son,* and God the *Holy Ghoſt,* though three diſtinct Perſons, make but one God, who is an eternal Spirit, therefore of one *Nature*; yet the ſecond Perſon in the ſacred *Trinity,* taking *Fleſh* upon him, may very juſtly be ſaid to have two *Natures, viz.* thoſe of *God* and *Man.*

19. He believes the moſt juſt God to have puniſhed a moſt innocent Perſon, and to have juſtified himſelf though a moſt ungodly Sinner.

Solution. The whole Race of *Adam* being involved in Sin, deſerved, moſt juſtly, the Wrath of God; but as the ſecond Perſon in the moſt divine Trinity purpoſed from all Eternity to redeem Mankind; ſo by dying for them, he is ſaid to have been *puniſhed*: And as the beſt Chriſtian, by Birth and alſo by Action is continually ſinning; yet by true Repentance, and Faith in *Chriſt,* he is *juſtified* by God, though he confeſſes himſelf the worſt of *Sinners.*

20. He is the moſt temperate of all Men, yet fares moſt deliciouſly.

Solution. For while he is indifferent about, and ſits looſe to all earthly Comforts, in which his Temperance conſiſts, he enjoys *Peace* of *Mind* and a good *Conſcience,* which give him more real Pleaſures than all that this World can afford.

Promiſcuous

Promiſcuous Queſtions, both Arithmetical and of Pleaſantry.

1. FULL three times Ten, and four times Nine,
Twice five times Eight and Seven;
What do they make, with nine times Six,
Thrice eight times Twelve and 'Leven? *Anſw.* 506.

2. The Account of a certain Cathedral is as follows, *viz.*
As many Days as in one Year there be,
So many Windows in one Church we ſee:
As many Marble Pillars there appear,
As there are Hours throughout the fleeting Year:
As many Gates as Moons one Year doth view:
Strange Tale to tell, yet not more ſtrange than true.
What Church is it? How many Windows, Pillars and Gates had it? And give the Sum of them all together.

Solution.

Windows 365 = as many Days
Pillars 8760 = - - - Hours } *Saliſbury* Cathedral.
Gates - 13 = - - - Moons }

9143

3. Suppoſe ten Half-pence to be placed in a right Line; I demand how they may be doubled, when any one ſingle Half-penny, ſhall cover the third diſtant from it?

Solution.

1	2	3	4	5	6	7	8	9	10	*Indices.*
o	o	o	o	o	o	o	o	o	o	*Half-pence.*

1ſt, Thus,

1	2	3	4	5	6	7	8	9	10	
o	o	o	9	o	o		o	o	8	*7th covereth 10th.*

2d Thus,

1	2	3	4	5	6	7	8	9	10	
o	8	o	o		o		o	o	8	*5th covereth 2d.*

3d, Thus,

1	2	3	4	5	6	7	8	9	10	
o	8		o		o		8	o	8	*3d covereth 8th.*

4th, Thus,

1	2	3	4	5	6	7	8	9	10	
	8		o		8		8	o	8	*1ſt covereth 6th.*

5th, Thus,

1	2	3	4	5	6	7	8	9	10	
	8		8		8		8		8	*9th covereth 4th.*

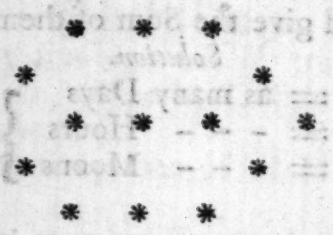
4. My

4. My Water-Tub holds 80 Gallons, when full; but being faulty at the Bottom, is continually dropping; now admit that it drops once in a Second of Time, and that 100 ſuch Drops would fill Half a Quarter of a Pint, in what Time would it be empty?

Solution. In 80 Gallons are 5120 Half Quarters of Pints, and thoſe multiplied by 100 give ſo many Drops, equal to as many Seconds; which reduced into higher Terms, give 5 Days, 22 Hours, 13 Minutes, 20 Seconds; and ſo long would the Water in the ſaid Tub be dropping out.

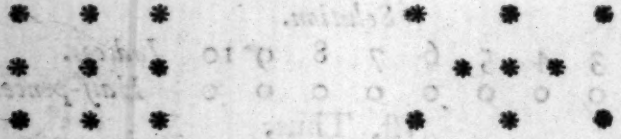
5. Place 15 Trees in ſuch Manner, that there may be 15 Rows, containing 3 Trees in a Row; and 1 Row more, conſiſting of 5 Trees, without deſtroying the Order of the other 15 Rows.

Solution.

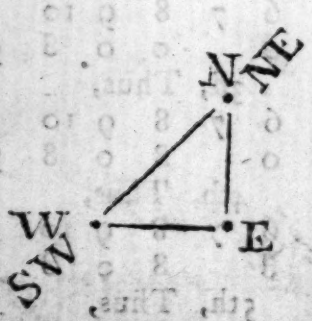


6. Place 9 Trees in ſuch Manner that they may make 8 Rows, at 3 Trees in each Row.

Solution.



7. Let 3 Points be placed in ſuch Sort, that 2 may ſtand Eaſt and Weſt; 2 North and South, and 2 North-Eaſt and South-Weſt.



8. I have ſeen a Torrent of Water run down the Kennel in *Tower-ſtreet* with ſome Rapidity: Now admit a Cork, put in at a certain Place, ſhould move a Yard and Half in Half a Second of Time, how far would it run in an Hour, ſuppoſing its Motion to be continued with the ſame Force;

$\frac{1}{2}$ *Sec.* $\frac{1}{2}$ *Ft.* $\frac{1}{2}$ *Sec.*
1 : 9 : : 7200 : 6 Miles, 1 Furlong, 20 Yds.

9. A Ship is freighted for *London* with 30540 Pipe-Staves, and 6780 Hogſhead-Staves, at 7 *l.* 5 *s.* *per* Thouſand Pipe-Staves: I demand what the Freight comes to, accounting 3 Hogſhead-Staves to be equal to 2 Pipe-Staves?

hhd.St. P.St. hhd.St. P.St.
3 : 2 : : 6780 : 4520
30540 + 4520 = 35060 *Pi. St.*
1000 : 7 *l.* 5 *s.* : : 35060 : 254 *l.* 2 *s.* 3 *d.*

10. *B*, according to the Currency of his Country, lets *A*, who lives in another Country, know that he owes him 93 *l.* 5 *s.* 6 *d.* and *A* in return, according to the Currency of his Place, pays him 66 *l.* 12 *s.* 6 *d.* by which Means the Debt is diſcharged without any Abatement: The Queſtion is, what is 100 *l.* of *A*'s Mony worth in *B*'s Currency?

A			B			A	B
l.	*s.*	*d.*	*l.*	*s.*	*d.*	*l.*	*l.*
66	12	6 :	93	5	6 : :	100 :	140

11. If 100 *l.* in one Place are equal to 140 *l.* in another, what is the Proportion in its loweſt Terms?

2)$\frac{10}{14}|\frac{0}{0}$(5/7 *Anſw.* $\frac{5}{7}$.
For as 100 : 140 or as 10 : 14 : : 5 : 7

Hence appears the ſhort Way, that Merchants have of computing how much Mony of one Country is equal to that of another, provided the Rate *per Cent.* is firſt known. Now let it be granted, that

12. *A* and *B* are Merchants reſiding at diſtant Places, and 100 *l.* of *A*'s Currency are equal to 140 *l.* of *B*'s Currency; what muſt *A* pay to *B* to clear a Debt of 1000 *l.* 19 *s.* 4 *d.*?

B	A		B			A			
l.	*l.*		*l.*	*s.*	*d.*	*l.*	*s.*	*d.*	*qr.*
140 :	100 :	:	1000	19	4 :	714	19	6	1 $\frac{48}{336} = \frac{1}{7}$

Thus abbreviated.

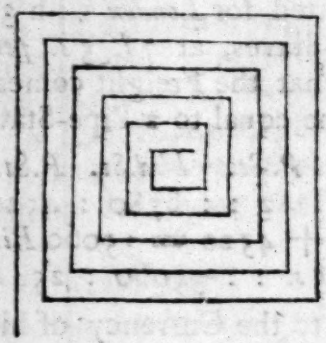
7 : 5 : : 1000 19 4 : 714 19 6 1 $\frac{1}{7}$

And

And this Proportion of 7 to 5 one Way, or of 5 to 7 the other Way, being once known, a Multiplier and Diviſor are always ready for the ſpeedy reducing the Mony of one Country into the Mony of another.

13. There is a Piece of Paper, which is juſt 12 Inches ſquare; I would have 12 Yards taken from it, all in one Piece, whoſe Width ſhall be a Quarter of an Inch.

Solution. It muſt be cut Spiral-wiſe as hereunder.



14. A Man went to *Billingsgate*, and bought a Peck of *Milton* Oyſters, for 3 Shillings: When he came Home, he told them out, and found their Number to be 199, which were, one with another, about eleven for Two-pence: Now admit theſe Oyſters were divided into three Sorts, *viz.* large 48, middling 66, and ſmall 85, and the largeſt to be ſold at 3 for Two-pence, the middling at a Halfpenny a-piece, and the ſmall at 3 for a Penny, what would be the Gain? *Anſw.* 4*s.* 9*d.* *and an Oyſter over.*

15. Some Fiſhermen having been a fiſhing, and caught nothing, ſat down to louſe themſelves: A Man coming by, aſked them what Succeſs they had; to which they anſwered, What they caught they left behind them; and what they could not catch, they took away with them.

Solution. The Fiſhermen, as they could catch no Fiſh, meant Lice; which when they had taken and kill'd, they left behind them, by throwing them away; and what they could not catch they took away with them in their Clothes.

16. It is ſaid by experienced Bankers and Gardeners, that a Bank of 7 Feet in Height, perpendicularly ſo, will require its Baſe or Bottom to be 10 Feet in Width: Now a Gardener having ſuch a Bank, and being willing to ſave ſo much Ground, and have it planted, would, inſtead thereof, have a Row of Pales or Palliſadoes; but he is willing, firſt of all, to ſtate the Expenſe one Way, and the Gain the other. The

Length

Length of the Ground that was to be encloſed or paled was 160 Feet, and the Paling 7 Feet high; all which a Carpenter would do, and find the Materials, for 5 Shillings *per* Yard ſquare, and level the Bank into the Bargain. Again, he conſidered the Quantity of Ground, thus ſaved, was not only 160 Feet long, as aforeſaid, but 10 Feet broad; and that every ſquare Foot would produce 5 Carrots, and thoſe Carrots be ſold at 2 for three Farthings: Now admitting all this; and that the Paling would ſtand 10 Years without Repair; what would he gain or loſe at the End of the ſaid Time?

1. $160 \times 7 = 1120$ ſq. Ft. $= 124\frac{4}{9}$ ſq. Yds.
2. $124\frac{4}{9}$ at 5*s.* $= 31$*l.* 0*s.* 6*d.* $\frac{1}{2}$
3. $160 \times 10 \times 5 = 8000$ Carrots
4. 2 Ca. : 3 *qrs.* : : 8000 Ca. : 12*l.* 10*s.*
5. 12*l.* 10*s.* $\times 10 = 125$*l.*
6. $125 - 31\ 0\ 6\frac{1}{2} = 93$*l.* 19*s.* 5*d.* $\frac{1}{2}$ Gain.

17. A Butcher went to Market, and bought 20 Beaſts for 20*l.* he had Oxen at 4*l.* a-piece, Calves at 15*s.* a-piece, and Sheep at 5*s.* a-piece: How many of each had he?

18. In the Pariſh-Church of *Tiverton* in *Devonſhire*, lie buried *Edward Courtney* Earl of *Devonſhire*, and his Counteſs, under their Effigies in Alabaſter, with this Epitaph;

Ho, ho, who lies here?
'Tis I the good Earl of *Devonſhire*,
With *Kate* my Wife, to me full dear.
We lived together Fifty-five Year.
That we ſpent, we had;
That we left, we loſt:
That we gave, we have.

Solution. What Mony the Earl and his Counteſs ſpent, they had ſomething for it; thus they had what they ſpent. — What they left behind them when they died, was loſt to them, becauſe not diſpoſed of to a good End. — What they gave, or diſpoſed of to charitable Uſes, was ſo much laid up in Store, to be received in the Kingdom of Heaven, which, 'tis hoped, fell to their Lot; thus what they gave, they have.

19. I have a Water-Tub, which contains 126 Wine Gallons: Now it happen'd on a rainy Day, that the Spout over it ran with ſo fine a Thread, that a Wine Pint could not be filled in leſs than 15 Minutes; I demand the Length of Time that

that the ſame Thread (ſuppoſing it to be continually running) would take up to fill the ſaid Water-Tub? *Anſw.* 1 *Day*, 12 *Hours*.

20. Says *Jack* to his Siſters, *Sue*, *Mary* and *Nan*,
You pretend to be Scholars; now tell if you can;
How many Plumbs have I? Some Help I will give,
But 'tis only what follows, nought elſe as I live:
I've the Half of Five Hundred; the Third of nine Score;
The Fourth of one Million; twelve Hundred and four;
With ten times nine Thouſand; ſix Dozen and five;
And ninety-two Half Scores as I am alive.
Now if you can give me the Number with Speed,
You ſhall be rewarded, dear Siſters indeed.

Anſw. 342509 *Plumbs*.

21. The new River, from its Beginning at *Ware*, to the great Reſervoir or Baſon at *Iſlington*, is judged to be about 60 Miles; and its Stream moves in ſuch an equable Manner, that any thing caſt into it, which will not ſink, will move about 10 Feet in 6 Seconds of Time: How long will a Cork be in moving from the Beginning to the End of the ſaid River, ſuppoſing that it had a free Paſſage all the Way, and no Grates or Locks to check or hinder its Courſe? Alſo at what Hour would it arrive there, admitting it to be put in on *Monday* at Ten in the Morning? *Anſw.* 2 *Days*, 4 *Hours*, 48 *Minutes*, *or* 48 *Minutes paſt Two on Wedneſday in the Afternoon*.

F.	*Sec.*	*Miles.*	*Sec.*
10	6	60	190080

22. *Nancy*, one Day, playing with her Cat, by Accident broke a prodigious large China Punch-Bowl, which held nine Gallons and a Half, and had in it three Setts of the fineſt China, that could be procured, or that ever was ſeen, which were broke alſo, and which coſt I know not how much. Her Mama was extremely angry with her, and chid her very ſeverely for her great Careleſſneſs; at which ſhe fell upon her Knees, and with Tears ſaid, Dear Mama, I will pay you for all the Damage, if you will not be angry with me. *Nancy*, ſays her Mama, becauſe you did not break the China for the Purpoſe, though I gave a great many Pieces of Mony for it, yet, after telling you how many and what thoſe Pieces were, if you can tell me how much the Bowl coſt, I will forgive you: If not, you muſt pay for it all. The ſeveral Pieces and their Number were as follows, *viz*.

14 Moidores

14 Moidores
12 Six and thirty Pieces
22 Five Pound Pieces
15 Three Pound Twelve Pieces
13 Two Guinea Pieces
17 Guineas
19 Half Guineas
73 Crowns
107 Half Crowns
419 Shillings
100 Groats
500 Sixpences
1000 Threepences
4000 Twopences
10000 Silver Pennies
10 Queen *Ann*'s Farthings which coſt me 40 Shillings and Six-pence apiece.

How much did all the China coſt?

Anſw. 434 *l.* 2*s.* 2*d.*

23. A thrifty Roper, once much Wealth did ſave,
And to his Daughter fair this Portion gave:
Fifty new Ropes, each Rope thrice twenty Foot;
At each Yard's Diſtance was a firm ti'd knot;
By ev'ry Knot hung thirty Purſes fixt;
In ev'ry Purſe were Crowns and Guineas mixt;
To three bright Crowns, two Pieces of pure Gold:
What is her Fortune when together told? *Anſw.* 130500 *l.*

24. How are four ones to be placed that they may make juſt 12?

25 I have a Hog, a Goat, a Cow,
With one fat Calf, two Pigs and Sow;
All which, with one Ram and two Sheep,
Are full as much as I can keep.
'Tis true, they do afford to me,
My Wife, and all my Family,
Some Nouriſhment; but that wont do,
For they muſt all to Market go,
And ſomething get for all my Pain,
Or I ſhall bring them Home again.
The Profit I intend to make
(And nothing leſs for them I'll take)
Is, for my Hog three Shillings clear;
And twice three for my Goat (not dear)
My Cow muſt gain one Pound and Crown;
My Calf the ſame, or I'm undone.
And what I gain for my Dun Cow,
Two thirds muſt be for Pigs and Sow:
Then for my Ram and two good Sheep,
Five Crowns they clear, or I not ſleep.
Now as they coſt me forty Pounds,
When I them bought, with twice three Crowns,

What

What muſt I ſell each for again,
The 'foreſaid Profit to be ta'en?

Solution.

As the whole clear Gain
Is to the firſt Coſt and Gain together;
So is the Gain made by each of the Beaſts,
To the Sum which they muſt be ſold for.

26. A Man bought 100 Oranges at 2 for a Penny, and 100 at 3 for a Penny, and ſold them again at 5 for Two-pence: What was the Gain or Loſs by the Sale thereof? *Anſw* $3\frac{1}{3}d.$ Loſs.

27. Divide 20 Shillings in ſuch Manner that *A* may have $\frac{1}{3}$, *C* $\frac{1}{4}$, *D* $\frac{1}{5}$, and *E* $\frac{1}{6}$.

Note, *In Queſtions of this Nature, when the ſeveral Parts are not equivalent to the whole Sum, whether they be more or leſs, the ſeveral Parts required muſt bear ſuch Proportion to the given Parts, as the Sum of the given Parts does to the given Sum.*

	s.	*d.*	*qr.*
A	7	0	0 $\frac{192}{228}$
C	5	3	0 $\frac{144}{228}$
D	4	2	2 $\frac{24}{288}$
E	3	6	0 $\frac{96}{228}$
	20	0	0

28. What Sum of Mony is that, which being divided by 5, will give the Quotient in ſuch Manner that the Pounds, Shillings and Pence ſhall be in arithmetical Progreſſion whoſe common Difference is 1, and the Sum of thoſe Numbers 18?

Note, *There is nothing more in this Queſtion, than to find three ſuch Numbers in Pounds, Shillings and Pence, as make* 18, *which is very eaſy, and then multiply them by* 5; *the reſt is purpoſely omitted.*

29. What Sum of Mony is that, which being divided by 2, the Pounds in the Quotient will be equal to the Shillings in the Dividend; and the Shillings in the Quotient, will be equal to the Pounds in the Dividend? *Anſw.* 13*l.* 6*s.*

30. How many Heads, Legs, Eyes and Claws,
Has nineteen Score and ten Jack-Daws. *Anſw.* 5070.

31. How many Deals of 12 Feet long, and 1 Inch and a Half thick, are equal to 500 Deals each 19 Feet long, and 2 Inches and three Quarters thick?

Solution.

Solution.

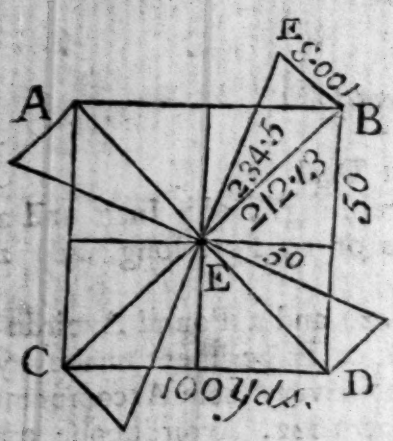
$2\frac{3}{4} = .229 +$ of a Foot.
$.229 \times 19 \times 500 = 2175.5$ Feet ſolid
$1.5 = .125$ of a Foot
$.125 \times 12 = 1.5$ Foot ſolid in 1 Deal
$1.5)2175.5$ (1450 Deals of 12 Feet long, and 1 Inch and a Half thick, are equal to 500 Deals of 19 Feet long, and 2 Inches $\frac{3}{4}$ thick.

32. A Pound Troy contains 12 *oz.* and a Pound Avoirdupoiſe 16 *oz.* Now from a very nice Experiment made by the late Mr. *John Ward*, who was a very able Accomptant and Mathematician, it appears that 16 *oz.* Avoirdupoiſe are equal to 14 *oz.* 11 *dwts.* 15 *grs.* and $\frac{1}{2}$ Troy; what Weight Avoirdupoiſe is equal to 12 *oz.* Troy?

oz.	*dwts.*	*gr.*		*oz.*		*oz.*	*dr.*	*qrs.*
14	11	$15\frac{1}{2}$	:	16	: :	12	: 13	2 $2\frac{9322}{13999}$

33. Says *Jack* to his Brother *Ned*, my Uncle *William Greybeard* has paid Nature's laſt Debt, and has left me his fine Houſe and Garden: Now, Brother *Ned!* as the Garden is Quadrangular, I intend to build 4 Towers at the four Angles or Corners, each of which ſhall be 100 Feet high: The Diſtance between each Tower's Center, you know, will be 100 Yards. But (ſays *Jack*) becauſe I would do ſomething, that never was done yet, I intend to have 4 Ladders, all of a Length, that ſhall reach from the Center of the Garden to the Top of the Tower: Now, as I know very little of Arithmetic, and you are a very good Accomptant, Brother *Ned*, tell me what muſt be the Length of each Ladder.

Solution. Every large Square (as A B C D) is compoſed of four ſmall Squares, each Side being juſt half of the Side of the given Square, *viz.* 50 Yards. The Center of the given Square (as E) is the angular Point to the 4 leſſer Squares joined together. Now a Line running from the Center to any of the Angles of the given Square or Garden, will divide that leſſer Square into two Triangles (as E B) and is the Hypothenuſe to either of them: This Hypothenuſe is found by common Numbers according to the Method of calculating Triangles, *viz.* by finding the Square Root of the Sum of the Squares of the Baſe and Perpendicular of any one of the leſſer Squares (as they are all alike) and this ſquare Root is the Baſe of another new Triangle, of which the intended Ladder (as E F) is the Hypothenuſe, and the Tower F B (= 100 Feet, or a third Part of the Side of the Garden) is the Perpendicular.



50 × 50 = 2500
50 × 50 = 2500
Yds.
5000.(70.71 + = EB
49
1407)10000
9849
14141)15100
14141
959

70.71 × 3 = 212.13 Feet = EB

Or EB in Feet may be thus found.

50 Yds. are = 150 Feet
150 × 150 = 22500
150 × 150 = 22500

45000.(212.13 = EB in Feet.
4
41)50
41
422)900
844
4241)5600
4241
42423)135900
127269
8631 = 959 × 9, becauſe the Yards

being multiplied by 3 to bring them into Feet, occaſions this laſt Remainder to be 9 times greater than the other, the Square of 3 being 9.

212.13 × 212.13 = 44999.1369
100 × 100 - - = 10000.

54999.1369(234.518 Feet, = EF, the Length of each of the several Ladders.
4
43)149
129
464)2099
1856
4685)24313
23425
46901)88869
46901
469028)4196800
3752224
444576

34. Out of the following Figures, *viz.* 11133355577799, it is required to find five of them that will make 20?

11 + 3 + 3 + 3 = 20
or
11 + 5 + 3 + 1 = 20

Note, *The Difficulty in answering this Question arises from the Use of two ones, not as* 1 *and* 1, *which make two, but as* 10 *and* 1, *which make* 11. *It can be answered in no other Manner than the two foregoing Ways.*

35. Change a Guinea into 20 Pieces, but let there be no Crowns, Half-Crowns, Shillings nor Six-pences.

3	*Qr. Guineas*	0 . 15 . 9
12	*Groats*	0 . 4 . 0
5	*Three-pences*	0 . 1 . 3
Pieces 20		1 1 0

36. It is said, *Gen.* vi. 15, that *Noah*'s Ark was 300 Cubits long, 50 Cubits broad, and 30 Cubits high; what was the Length, Breadth and Heighth in *Engliſh* Meaſure?

Note, *A Cubit is* = 1.824 *Foot.*

Feet.

Anſw. { 547.2 *long.*
91.2 *broad.*
54.72 *high.*

37. Place the Alphabet in ſuch Manner that A and Z may be as near together as K and L, without tranſgreſſing the commonly received Order of it.

Solution. *Make a Circle, and divide it into* 26 *equal Parts; on the Outſide or Inſide of which write the Alphabet; ſo will* A *and* Z *be as near as* K *and* L.

38. The Globe of the Earth being 360 Degrees, and each Degree upon its greateſt Circle equal to 69 Miles and an Half; in what Time might a Man travel quite round on ſuch a Circle (admitting there were Conveniencies for it) at the Rate of 20 Miles *per* Day? *Anſw.* 3 *Years,* 5 *Months,* 16 *Days, allowing* 28 *Days to a Month.*

$360 \times 69.5 = 25020$ *Miles.*

M. D. M. Y. M. D.
20 : 1 : : 25020 : 3 5 16

39. Admit the Sun to be on the Line; and at his ſetting, to be, by a good Obſervation, juſt 1 Degree above the Horizon; admit alſo a Man to be travelling on the Line full Weſt, with the Sun right before him; how many Miles muſt he travel *per* Hour, to keep the Sun in the ſame Poſition? *Anſw.* 1042.5 *Miles per Hour, allowing* 69.5 *Miles to a Degree.*

H. Deg. H. H.
24 : 360 : : 1 : 1042.5 *Miles.*

Miſcellaneous Arithmetic:

OR A FULL

ACCOUNT of the NEW CALENDAR, &c.

PART VII.

OF THE EDUCATION of CHILDREN,

So far as relates to the ſeveral

SCIENCES which they are to learn at School.

Of Reading.

AMONG the ſeveral Branches of Literature commonly taught in Schools, there is not one, perhaps, more difficult, or leſs regarded, than that of Reading. I don't mean the bare Pronunciation of the Words, for that is not the Caſe; but the Reading with a proper Tone and Cadence; laying a juſt Streſs or Emphaſis on ſuch Words as require it; whereby the Sentence, whatever it is, will appear according to the Mind of the Author: Without this, an Expreſſion is often miſunderſtood; and what is really an Interrogation, may, by laying a Streſs or Emphaſis on wrong Words, be changed into a determinate Sentence. And it is no unuſual Thing to meet with an Expreſſion that is capable of bearing a double Conſtruction, which by an undue reading, will have the Reverſe of what was primarily intended. Now one Way (and perhaps the only one) to remedy this Inconvenience, is, to let the Scholar be furniſhed with ſuch Books as will (with due Care in the Tutor) oblige him to fall into this Way, ſuch as the *Spectators*, *Guardian*, *Tatlers*, *Milton's Paradiſe Loſt*, *Young's Night Thoughts*, and many others, with which we have the Happi-

neſs to abound. But this is ſeldom or never done in a Day-School, where oftentimes the Charge of a Bible and Common Prayer Book only, are thought much of. And yet it is expected thoſe Children ſhould read as well as the beſt, though they are not furniſhed with ſuch Helps as are neceſſary for the Purpoſe; and without which, no Maſter, how capable and diligent ſoever he be, can forward his Pupils. And it is certain, that Boys of Ability and Inclination, whoſe Parents are happy in Circumſtances, and are not afraid of the Expenſe, muſt make the deſired Improvement.

Of Writing.

The Uſefulneſs of the Pen, in all its Varieties, but eſpecially in the Round-Hand, is ſo very great and extenſive, that very little need be ſaid concerning it, eſpecially ſince moſt People are now very induſtrious to have their Children acquire the free Uſe thereof. Within the laſt Century, very great Improvements have been made in Writing; and perhaps it is at this Time arrived to that Perfection as not to be much exceeded. And as no Buſineſs can be well carried on without ſetting Pen to Paper; it muſt certainly look extreamly pleaſing to the Eye, to ſee Books of Accompts well and orderly wrote; while, on the contrary, to ſee Books ill wrote, blotted, and in which is bad Spelling, muſt give as large a Share of Pain.

Amidſt the ſeveral Sorts of Writing, that particular Part of it called *Short-Hand*, is of late Years, become none of the leaſt; and its great Uſefulneſs in taking down Speeches made *Extempore* in the two Houſes of Parliament, Trials, *&c.* by which Means many very valuable Expreſſions are preſerved, which otherwiſe would be loſt, declare it to be ſo. In every Court of Judicature, the Judges thereof know the Advantages which ariſe from it, becauſe they are thereby enabled to take down the ſeveral Depoſitions of the Evidences, and then ſum them up, and from thence deliver their Opinions to the Jury, who give the final Sentence. In other more ordinary Caſes, its Uſe is found in the quick Diſpatch it makes of committing a Man's Thoughts to Paper, and likewiſe in the Secrecy thereof (if he is minded to have it ſo) inaſmuch as it is not eaſy for any one to read it, but only ſuch as uſe the ſame Alphabet, and other Marks of Abbreviation.

The Variety of Hands ſerve very well for Ornament in Books of Accompts, where there is any Leiſure for the ſame: and indeed, all Books of Accompts ſhould not only be regularly

larly kept, but well wrote likewiſe, that in caſe of any Examination on the Score of Bankruptcy, Deceaſe, or any other Occaſion whatſoever, they can be eaſily looked over and examined; and if any thing happens amiſs, it is thereby ſooner ſet right, to the Satisfaction of every Party concerned therein.

Of the Want of School Neceſſaries, beſide Books to read in.

The Want of common Neceſſaries at School, ſuch as Writing-Books, Pens, Ink, Paper, Pencils, *&c.* is another Impediment in the Way of a School-Boy's Progreſs in his Learning.

All People would have their Children improve in Writing, but many of them are put to great Pain at the Charge of Writing-Books. Some think they write too much, others, that they tare their Books to Pieces too faſt, forgetting how it was with them when they were Children themſelves; or if they happened to be of the careful Sort, think their own Children muſt be ſo too. Now the Want of School-Neceſſaries is a prodigious Hindrance: And as Parents would have their Children improve; ſo they muſt not deny them ſuch things as tend to their Improvement; and without which they can't improve at all. Hence it follows, that People of mean Abilities can't reaſonably expect that their Children ſhould improve ſo faſt as thoſe whoſe Circumſtances are better, and whoſe Childrene njoy all the Neceſſaries that are requiſite.

And here, ſuch Schools have the Advantage, the Maſters of which have every thing that is proper for their Pupils Improvement by them, without the Parents furniſhing them with every thing they want (which is generally of the worſt Kind) and this, though attended with ſome Expenſe, yet the Scholars find the Advantage by it, and the Parents the Satisfaction of ſeeing their Children improve in an eaſy and regular Manner.

Of changing Maſters.

Parents when they have found a Maſter that they can confide in, ſhould, even religiouſly, conform to his Directions; and when it happens that their Children don't make ſo good an Improvement as is expected by their Parents, it ſhould rather be imputed to the Pupil's Careleſſneſs, or want of Ability. than the Maſter's Negligence: Since it is attended with a great deal of Danger, after having made Choice of a proper Maſter, to lay the Blame of the Scholar's Non-improvement on him. See *An Eſſay on the Education of Charity-Children*, p. 7.

Of

Of Method in a School.

Every Schoolmaſter muſt (like all other Men of different Occupations) have a Method; out of which, if he ſuffers himſelf to be put, all is disjointed; and inſtead of Harmony, his whole School will be put into the utmoſt Confuſion, and himſelf in the greateſt Perplexity. Hence all Parents ſhould be very far from giving Directions to the Schoolmaſter how he ſhould manage their Children in Point of Inſtruction in Literature: For if the Maſter pulls one Way, and the Parents another, it is certain that the Children will make very little Improvement. Some People are mighty fond of recommending the Method themſelves were taught by: But ſhould a Schoolmaſter attempt to teach every Child by the Method his Parents ſhall preſcribe, he would not be able to teach ſix of them aright, occaſioned by ſuch a Diverſity of Methods: Nay, if he has one general Method, and that Method not very juſt, thoſe ſix Boys, if they have any Spirits, and regard their own Improvement, will preſs ſo hard upon him as to make him run almoſt beſide himſelf, for want of Employment, becauſe they can do Buſineſs faſter than their Maſter can find it for them to do. And this I ſhall make appear in the following Manner.

Suppoſe, for Example, a Maſter ſhould always rule his Scholars Writing-Books; it is now well known that this will rob him of a great deal of his Time, which will be more profitably ſpent in Inſtruction: and if he be the moſt expert Ruler, the juſt Diſtances of the Lines, this Way, can never be come at: For what with Haſte, and perhaps, Impatience, the Ruler will ſometimes ſlip; or if it be made the leaſt tapering, will of itſelf run uneven, and as it were, twiſt about, and make the Lines run wide from a Parallel. Now the beſt Remedy for this Inconvenience, is black Lines; thoſe, which I have contrived for my School, are after this Manner, *viz.* a double Line for the Body of the Letter, a Line for the Top of the Letter, and another below for the Tail, with a ſloping Line for the Poſition. Now as nothing of this Kind can be done with a Ruler and Plummet; ſo Copper-Plate-Lines of this Kind are the moſt uſeful Contrivance for the Improvement of Writing, that can be; and if they be made for various Sizes (four being enough) it will ſtill further that Improvement. By this Means all that Time is ſaved, that is ſpent in ruling Writing-Books. Again,

Suppoſe

Suppoſe he has a competent Number of Cypherers, and ſhould ſet all their Cyphering-Books; this will rob him of more Time than the ruling the Writing-Books. Nor is this the Worſt: For if to eaſe himſelf, and to bring this Kind of Buſineſs into a narrow Compaſs, he ſets but a few Sums, his Scholars will ſtand ſtill for want of Employment, and harraſs him moſt ſadly that Way: And, if to keep them full employed, he ſets them a ſufficient Quantity, ſo much of his Time, by this Means will be engroſs'd, that he will ſcarce have any left for Inſtruction; eſpecially if he adds to this the ornamental Part, which ſome Writing-Maſters, to ſhew their Skill, are very fond of. For this Inconvenience alſo, I have provided a Remedy, called *The Schoolmaſters Aſſiſtant*, with another, called the *Young Book-keepers Aſſiſtant* (both pretty well known now) where there is always Buſineſs enough in Arithmetic and Book-keeping, ready cut out. By theſe Means a young Gentleman intended for Buſineſs in the *Mercantile* Way, when he comes to School, has his Buſineſs always ready prepared to his Hand, and without any Fatigue to his Tutor. Hence (if the Parents would not ſpare their Pockets) many other uſeful Parts of Literature might be taught, ſuch as *Grammar*, *French*, *Geography*, and the ſeveral Branches of the *Mathematics*, moſt of which are in many Schools intirely omitted, for want of ſuch a ſpeedy Method as this is. Now Children placed out in Schools where the foregoing Methods are uſed, have all the Advantages that can be practiſed or even deſired. As to ſuch Maſters of Schools, as, for the ſake of getting a Number of Scholars, do it at ſo mean a Price, that they can ſcarce make a Livelihood of it, very little need be ſaid about them, becauſe I think they ſay enough for themſelves. Beſide, when Parents, as it were, hawk about for the cheapeſt Schools, and would have a great deal of Learning for a little Mony, if they happen to be baulk'd, can blame nobody for it but themſelves. Not to ſay, according to the common Way of Trading, if the beſt things coſt the moſt Mony, the worſt Sort ſhould not coſt ſo much; and therefore, if Parents ſtand reſolved to give but a little Mony for their Children's Education; Reaſon will direct that they muſt not expect it in ſo ample a Manner as where a larger Price is given.

Of the Modern Languages.

Theſe are ſerviceable to all trading Perſons, eſpecially ſuch as ſend Goods to, or receive them from any foreign Kingdom. And here, whatever particular Sort of Trade, any young

young Gentleman is deſigned for, whether it be to *France*, *Spain*, *Portugal*, *Italy*, or any other Kingdom, it would not be amiſs to learn the Language of that Country. However, as the *French* Language is univerſally known in all Parts of *Europe*, it may be worth the while for the young Merchant to be acquainted with that, ſince he will in all Probability, often find Occaſion to underſtand it, by writing himſelf, or receiving Letters in that Language.

Of Mathematics.

By theſe I mean Geometry, Trigonometry, Dialling, Aſtronomy, Navigation, Surveying, Gauging, and the like, all which Studies are to ſome profitable, but to every one moſt pleaſant and delightful. And no Time (except in the immediate Acts of Religion) can be better ſpent with leſs Repentance, than in ſuch Speculations as theſe. 'Tis owing to Studies of this Kind, that ſo many ſurpriſing Concluſions, numerical, optical and mechanical, have taken their Riſe: conſequently where there are both Time and Abilities, they ought not to be omitted: I ſhall only obſerve here, that *Geography*, which is a Science that conſiſts in the Knowledge of the ſeveral Parts of the Globe, the Situation of diſtant Lands, Cities, Towns, *&c.* together with a Knowledge of the Manners and Cuſtoms of the ſeveral Inhabitants, is very uſeful and very eaſily attained, is nevertheleſs almoſt as much neglected as it is uſeful. And it is very ſurprizing to me, that a Science which comes within the Compaſs of every Pupil's Underſtanding, ſhould be ſo much condemn'd even by Parents, as to forbid their Children learning it, becauſe they think it will be of no Service to them.

Of Book-Keeping.

As a great deal has been ſaid already in my *Young Book-keepers Aſſiſtant*, both by Preface and Notes, very little may be ſaid here. I ſhall therefore only obſerve, that it is the Art or Myſtery of keeping an Account of all Tranſactions of Trade; the Incomes and Expenſes of Eſtates; and the Charges and Profits of a Prince's, Nobleman's and Gentleman's Revenue; ſo that at one View, the Advantage or Diſadvantage of the Whole, or any particular Part may be readily ſeen and diſcovered; for which Purpoſe, that moſt excellent Method, called *Double Entry*, or the *Italian* Manner, has been invented, and now generally practiſed by all regular Accomptants, eſpecially Merchants.

Of

Of the Engliſh Language.

Whatever may be ſaid in Commendation of foreign Languages, it is certain an *Engliſhman* ſhould underſtand the *Engliſh* Tongue; and, if it be poſſible, in all its Elegancies. And here, Parents happy in Circumſtances, and good Inclinations, and their Children happy in Abilities, are moſt likely to ſucceed. It is no ſmall Commendation for a young Gentleman or Lady to write a Piece of good *Engliſh*; and to be defective herein, is to be defective in an Eſſential: And therefore, as he who writes a bad Hand, or is ignorant of Figures, is very unfit to be a Book-Keeper; ſo he who is not Maſter of his own Language, at leaſt in ſome tolerable Degree, is equally unfit for that Employment. Beſides, the writing of a Letter well, and couching it in proper and pertinent Terms, muſt needs be very agreeable, even to the Writer of it; while another, who labours at it, for want of proper Diction, and a thorough Acquaintance with his Mother-Tongue (which will always produce unjuſt and lame Expreſſions, and oftentimes Miſunderſtandings) cannot, on a Survey of it, after it is wrote, but lament the want of that uſeful Share of Knowledge.

Writing Exerciſes.

By theſe are meant the Employment of the Time at Home, after School-Hours are over, in writing out, and then getting, *memoriter*, ſome uſeful Leſſon, either in Spelling, or what elſe the Tutor, in his Judgment, ſhall think moſt convenient for the Improvement of his Pupil; and herein the Learner will undoubtedly find his Advantage, by being employed in ſome Part of Literature, which has a Tendency to his future Good. Parents therefore do wrong to their Children, when they forbid this uſeful Employment: And it is a ſad Truth, that when Parents run counter to the Rules of the School, in which their Children are inſtructed, they do in Effect, teach thoſe Children to do the ſame thing. Hence, as Children are naturally prone to do wrong, it is impoſſible (by ſuch a Proceeding from the Parents) for them to make any tolerable Share of Improvement. For as they perceive the Wings of their Tutor's Authority to be clipped, and his Power over them leſſened, they of courſe, will undervalue, deſpiſe and deride him; and from being forbid to do what they ought, they will moſt certainly do what *they* ought not; the bad Conſequence of which is but too often ſeen, whenever Occurences of this Kind happen. Let the Parents then look to it,

if by with-holding their Children from obeying their Tutor's Directions, they, inſtead of being obedient Children, pick out their Parents Eyes, and turn reprobate.

Of the Method of examining Children at Home, and therein of the want of a becoming Preſence of Mind in them.

It is no uncommon Thing for Parents, when they have a Mind to try their Children's Capacities, to put very idle Queſtions to them, ſuch as the multiplying 2*s.* 6*d.* by 2*s.* 6*d.* and the like, which, in no Shape, will hold good, except in the Rule of Three, as before taught, and then, if a Failure happens, to ridicule either the Perſon ſo tried, or his Tutor, or both. But, that this is a very unfair way of dealing with young Heads, is manifeſt from the Trial itſelf, becauſe it is impoſſible to *ſet old Heads upon young Shoulders*; it happening that good and able Men, Men of Capacity and Genius, have ſometimes been confuſed and overcome, by ſuch ſudden but idle Propoſitions; and it is then no Wonder if a Boy ſhould be put to his *Ne plus ultra* by a like way of Proceeding. It muſt indeed be confeſſed, that whoever enjoys a good Preſence of Mind, is poſſeſſed of a very valuable Bleſſing; but how this is to be obtained, perhaps belongs more to the *Parents* than to the *Schoolmaſter*; it being certain (however great the Tutor's Care is in forwarding his Pupils) that many Boys can perform very commendably at School, who out of it can do nothing that is acceptable, nay ſometimes are ſcarce able to ſpeak; and the very fear of doing wrong before their Parents, has made them do ſo: Hence ſome Parents, not knowing rightly how to put the Queſtion to their Children, firſt quarrel with them, and next with their Tutors, when the Fault lies in neither of them. It was the Caſe once (as I have been credibly inform'd) of a Father, who, though he could not read himſelf, would take upon him to examin his Son; the Child being ſenſible of his Father's Inabilities, and hot Temper, and fearful, right or wrong, that his Father would correct him, ſtood quite mute, for which, the good Father, in the Height of his Paſſion, had like to have cut out his Eyes with a Horſe-Whip.

The whole Care and Management of Children, as I have elſewhere obſerved, in an *Eſſay on the Education of Charity-Children*, p. 7, does not lie on the Teacher altogether: There is ſomething to be done at Home, which (if Parents would learn to know themſelves) they might ſoon perceive what Part they are to act out of School-Hours. It is in ſhort

the

the ſetting them a good Example both in Speech and Action; never to be guilty of that Fault for which they reprove their Children; and by no Means to brow-beat them, except for Enormities; but at other Times, and for leſs Faults, to argue with them, and ſhew them their Errors, with ſuch Calmneſs and Evenneſs of Temper, as will make it appear to them, that ſuch Parents rather chuſe their Childrens Amendment than gratify a Paſſion in themſelves: Among other things, they ſhould be careful now and then to introduce them into good Company, where the Rules of good Manners ſhould be ſtrictly obſerved. Without this Way of Proceeding, it will be in vain for Parents to examin their Children about their Improvement, ſince they will very rarely be found to ſtand the Trial.

Of Drawing.

Amidſt the ſeveral beautiful and entertaining Arts, it muſt be confeſs'd, that Drawing has its Share of Admirers, as well as the reſt, and perhaps not the leaſt in Number. And if to behold the Reſemblances of things (if thoſe Reſemblances are accurately done) be a Pleaſure, it muſt be more ſo, to be able to make ſuch a Reſemblance one's-ſelf. Drawing, ſtrictly ſpeaking, ſignifies no more than the deſcribing the Outlines of any Subject to be imitated; but more commonly it includes Limning or Colouring, which is alſo called Painting: by the Help of which, a Flower, Bird, or any other Thing, may be imitated ſo nearly, as that it ſhall appear to be the Thing itſelf. And indeed this is the Perfection of the Art, to copy after Nature ſo cloſely, as that Art may be taken for Nature. Hence to be able to perform acceptably, and to excel in this Art, muſt not only give Pleaſure, but in many Caſes may be found neceſſary. The Story of *Parrhaſius* and *Zeuxis* is very entertaining, which runs thus.

Parrhaſius and *Zeuxis* were eminent Painters, and contended for Superiority. Each painted according to his Fancy; *Parrhaſius* painted a *Curtain*, and *Zeuxis* a Bunch of *Grapes*. As *Zeuxis* was carrying his Performance, it appeared ſo natural to the Birds, that they flew to it for the ſake of the imaginary Fruit, but were deceived. When *Zeuxis* came to *Parrhaſius*'s Houſe, and produced his Work, it was acknowledged to be very good, and ſo much the better as it had deceived the Birds. *Zeuxis* then deſired to ſee *Parrhaſius*'s Performance, and accordingly was led into the Room where the *Curtain* was; but he taking it for a real one, imagined *Parrhaſius*'s

ſius's Work was within it, and order'd the *Curtain* to be drawn, that he might behold it, which decided the Controverſy at once in favour of *Parrhaſius*; for though *Zeuxis*, by his Performance had deceived the Birds, yet *Parrhaſius* had carried the Point a great Way farther, by deceiving a Maſter of the Profeſſion.

Of Muſic.

From the firſt Inventor of this Art, down to the preſent Time, *Muſic* has ever been in the greateſt Eſteem; and the great Majority of Mankind have all along ſo ſtrongly declared in its Favour, that it is no Wonder its Number of Votaries are now become very great. Such is the Efficacy of *Muſic* (ſacred *Muſic* I mean) that it ſtrangely works upon the Paſſions of Men, and ſoftens their rugged Tempers and Diſpoſitions: Several Inſtances we have in ſacred Writ of this diſſolving and melting Quality, which ſo wrought upon *Saul*, by *David*'s playing on the Harp before him, when he was troubled with an Evil Spirit, as to make him well, *i. e.* eaſy in his Mind, who before labour'd under ſome very uneaſy and painful Senſations. Well may it then be called the Handmaid to Divinity, when its Influences are ſo ſurprizing. At this preſent Time, *Muſic* in ſome Caſes is carried too far, contrary to the Intention of the firſt Promoters of it; and to the Shame of ſuch Compoſers of it, be it ſpoken, that there is no Sett of Words, whether in Proſe or Verſe, how bad ſoever, but ſome looſe-principled Men will ſet them to Muſic. And the great Number of filthy and lewd Songs are now become ſo common, that it is hard to eſcape them. The *Muſic* therefore that I would recommend (and which yet ſtands recommended by much better Pens, and ſeems to gain Ground of late Years) is ſuch as is ſet to Words either ſacred, or at leaſt ſuch as runs not counter to it, and the Inſtruments are the *Spinnet*, *Harpſichord* or *Organ*, which are noble, and therefore very entertaining. Good Performances on theſe Inſtruments, carry with them irreſiſtible Charms, not only to the Hearers, but even the Performers. Hence Perſons of happy Circumſtances ſhould by no Means let their Children remain ignorant of an Art that *Solomon* calls *the Delight of the Sons of Men*, but cauſe them, among other Branches of a polite Education, to imbibe the Principles of this.

Of Dancing.

Dancing is an agreeable Motion of the Body, adjuſted by Art to the Meaſures of a muſical Inſtrument, or to the Voice:

and

and though it is perhaps the leaſt uſeful of any thing taught in Schools, it has, however, ſome that ſpeak in its Praiſe, both antient and modern: Though it muſt be confeſs'd, that while it has been held in Eſteem by ſome, it has been look'd on in a very contemptable Light by others. But however that may be, it certainly gives a Grace to ſuch as have been exerciſed that Way; and when uſed as it ought to be, has, in all Ages, more or leſs, been eſteemed a very genteel Accompliſhment: I ſay, when uſed as it ought to be; for if it be carried to an undue Length, it is preductive of ſomething that is tainting, and the Youth of both Sexes have ſometimes ſuffered very ſeverely by ſuch Indulgences. There was a Time when Dancing was made an Act of Religion; and no leſs a Man than *David*, the ſecond King over *Iſrael* did ſo, when he *danced* before the *Ark* to honour God, and expreſs his Exceſs of Joy for its Return into the City of *Zion*: However, nothing of this Kind is admitted of now; and the Art of *Dancing* is learned for nothing more than either to give a graceful Carriage, or for Pleaſure and the Benefit of Exerciſe. Hence we may conclude, that Dancing, of itſelf, is harmleſs; and when kept within due Bounds, is conducive to *Health*, by promoting Perſpiration, and throwing off ſuch ſuperfluous Matter as would otherwiſe, in Time, become deſtructive of it.

Of learning Latin.

However fond the major Part of Parents may be of their Children's learning the dead Languages, it is very certain, that many are put to this Taſk, which Nature forbids: And the pernicious Conſequences that follow from ſuch an ill concerted Proceeding, are ſuch, as ſome have all the Reaſon in the World to lament as long as they live. It is owing to this heavy Drudgery (and I can call it no otherwiſe, where Children are obliged to learn what they have no Abilities for) that many are ſpoilt from becoming both good Penmen, and good Accomptants, and conſequently good Merchants or Traders.

The learning *Latin* (for Example) is become ſo common, that in the Opinion of many People, their Children muſt be taught it, becauſe it makes them ſpell well; whereas nothing is more unlikely: And to ſay the beſt of it, it is ſuch a round-about Way to learn the *Engliſh* Language, as is by no Means warrantable; for the *Engliſh* may be taught grammatically, as well as the *Latin*, or any other Language; and the Time that is ſpent in going over the Rules in *Lilly*'s

Grammar, cannot be adequate to the Loſs of Knowledge in other Sciences, occaſioned thereby; eſpecially in ſuch, whoſe Abilities, or Circumſtances, or both, require them to be acquainted with ſuch things that more naturally fall in with Trade and Commerce, with which *Latin* has no Share at all. "There are many excellent Tempers which are worthy to "be nouriſhed and cultivated with all poſſible Diligence and "Care, that were never deſigned to be acquainted with *Ari-*"*ſtotle*, *Tully*, or *Virgil*." Spectator, Vol. 2, p. 278. Let it then be the Care of all Parents, when they have found a Teacher of Probity, to abide by his Determinations, and permit their Children to be inſtructed in ſuch Branches of Learning as they have an Inclination for, and will acquire with Pleaſure, but never force them to learn ſuch things as they have no Abilities for, or cannot come at, but with the Loſs of ſomething more beneficial.

Of the Circumſtances of Parents.

It is much to be wiſhed, that all Parents whoſe Care for their Children's Improvement in Learning, were happy in *Circumſtances*, in Proportion to the Expectations they have of their Children's Performances; the want of which, occaſions many Children, whoſe natural Abilities are exceeding good, to leave their Schools without being able to receive ſuch a Share of Education, as thoſe whoſe *Circumſtances* are really very affluent; and yet, ſtrange as it is, Parents of but low *Circumſtances*, expect their Children to make an Improvement in Learning (though it be only at the Writing School) equal to thoſe, whoſe Fortunes are ample enough to grant their Children all the Neceſſaries requiſite thereto. The Expenſe of Pens, Ink and Paper only, as has been before obſerved, (without which it is impoſſible to write a good Hand, or become an able Accomptant) are thought ſo much of by ſome narrow Spirits, that the Teacher is ſure to meet with a Reprimand for charging them in his Bill: What muſt be the Caſe then, where higher Attainments are expected? And yet higher Attainments will be attended with their reſpective Charges. But it is really very bad for Parents, whoſe *Circumſtances* are ſuch, as every one would wiſh to enjoy, to diſpute the Point with the Tutor, for ſuch neceſſary Articles as they can by no Means do without. This is like *Pharaoh*'s requiring the Children of *Iſrael* to make Bricks without Straw; and how hard their Caſe was, every one can determine very eaſily.

Of

Of Decency and Good Manners.

I have heard it reported, that *William* of *Wickham*, once Biſhop of *Wincheſter*, when he taught School, cauſed to be wrote there, in large Characters, this Motto, MANNERS MAKE A MAN: So ſenſible was he of the Force of good Manners; intimating thereby, that where young Perſons could be brought to conform to the Rules of Decency and good Behaviour, they were likely to reap the Benefit of them, by thriving in the World, and becoming uſeful Members of the Commonwealth; and ſuch as good *Manners* could take no Hold of, were as likely to prove bad Parents, bad Maſters of Families, and become the very Peſt of the Community. Now this Rule in Life muſt be taught by the Parents, at leaſt in a great Meaſure ſo, becauſe at the ordinary Day-Schools, Children are no longer under the Maſter's Inſpection than while they are at School; and when they are gone from thence, the Maſter cannot be accountable for their Miſbehaviour. And though it is very common for the Parents to charge the Maſter with Neglect, where good *Manners* are wanting in their Children, yet the ſame Parents take it very ill, if their Maſter ſhould correct their Children for being rude, and roundly tell him, he has nothing to do with their Children out of School-Hours. But in Truth, the Schoolmaſter, in this Caſe, has a hard Taſk of it, as it is like the Mariner's ſteering between the Rock *Scilla* and the Gulf *Charybdis*, where, if he avoids the one, 'tis great odds but he is ſplit to Pieces or caſt away upon the other.

Of School and Family Prayers.

How indifferently ſoever ſome may think of this, yet I beg Leave to aſſure my Reader, that it is of too great Conſequence to be neglected. We commonly ſay, If a Favour is not worth aſking for, it is not worth having: But if God Almighty ſhould deny his Favours to all thoſe that refuſe to aſk for them, their Condition muſt be very bad indeed, who do not receive them. Nor only ſo, but for want of this Chriſtian Armor, we lie open to the Arrows and Battery of our Spiritual Enemies, *viz.* the Devil and his Angels, whom St. *Paul* ſtyles *Principalities, and Powers, and the Rulers of Spiritual Wickedneſs in high Places*; implying that theſe are no ſmall Foes, which we have to contend with; but thoſe of the moſt powerful Kind. Wicked Spirits ſee us when we do not ſee them, and therefore it behooves us to be ſo much the more upon our Guard, that we be not overcome by them. And if it be true (as moſt certainly it is)

That it is good to draw near to God:
That if we ſeek God, he will be found of us:
That ſuch as are far from God ſhall periſh: And
That if we forſake God he will caſt us off for ever:

theſe ought to be ſtrong Motives to induce us to *pray without ceaſing*; that is, always to be in a praying Frame of Temper, and to lay hold of any Opportunity of praying when it offers. *Abraham* and *Joſhua*, *Cornelius* and *Aquila*, ſtand renowned upon ſacred Record, for the Piety of their Houſholds: And ſurely, if the Faith and Zeal of a good Houſholder, and I hope I ſhall be pardoned, if I ſay a good Schoolmaſter, be duly vigorous and ſtedfaſt, he cannot but delight to call the little Aſſembly of his Family, or School, together, to worſhip their infinitely good and gracious God, in whoſe Hands their Breath is, and *from whom cometh every good and perfect Gift*. And, to the End, that the right ordering the Morals of Youth be not neglected, there is no better Way (in a School) to do it, than by beginning and ending each Day's Study with Addreſſes to the great Creator and Preſerver of the Univerſe (which for Honour and Diſtinction's ſake, ſhould be that Pupil's Province, who ſtands firſt in the School) a very momentous Affair; too much neglected by many Teachers, but ſhould be omitted by none. And as the main End of Education is, or ſhould be with a View to Religion, in order to ſecure a happy Eternity, beſides its being made ſubſervient to the Affairs of this Life, it is a Matter of the laſt Importance, to take Care that young Minds be well ſeaſoned therein, the better to enable them to guard againſt the Superſtitions, Hereſies and Idolatries of the Church of *Rome*, which of late Years, prevail very much in *England*. Jeſuits and Romiſh Miſſionaries therefore, as they ſwarm (in Diſguiſe) in and about *London*, to make Proſelytes, and broach their pernicious Doctrines; this ſhould oblige all Proteſtants to uſe their utmoſt Endeavours to fortify their Children againſt every Attempt to ſeduce them to that wicked Church. Hence if Children are timely and properly armed, in order to make a ſuitable Reſiſtance, Decency and good Manners will naturally follow, or be the more eaſy inculcated. Hence alſo (as Parents and Schoolmaſters ſhould always begin and end their Buſineſs with God) we may obſerve, where Children ſee their Parents and Maſters uſe this Method of praying to and praiſing their great Creator, that they themſelves will be naturally led to do the like afterwards, which not only tend to the Glory of God in this Life, but the Salvation alſo, of their own immortal Souls in the Life to come.

N. B. The following Lines ſhould have been inſerted in p. 92, but as they were then omitted, it was thought adviſeable to place them here, rather than wholly omit them.

Whatever has been ſaid with regard to the exquiſite Workmanſhip of the Tabernacle, and all its Appendages; may without the leaſt Diminution, be applied to the Workmanſhip done by our Saviour, while he was in the Fleſh, and wrought in the Occupation of a Carpenter. For if the curious and admirable Mechaniſm of the Tabernacle, *&c.* was owing to the ſeveral Workmen's being inſpired, and taught by the immediate Direction of God Almighty himſelf, nothing leſs can be ſaid of the Saviour of the World *(who had all the Fulneſs of the Godhead dwelling in him, and had Wiſdom without Meaſure)* when he took an Inſtrument in Hand, whether Saw, Plane, or any other Implement of that Trade.

The Square and Compaſs mark'd out juſteſt Lines,
That what was moſt ſuperfluous might firſt
Be taken off by th' Weight of th' ſharper Ax:
The Saw made niceſt Kerf, and ſplinter'd not:
The lab'ring Plane, o'er ev'ry Piece it paſs'd,
Made rougheſt Wood, ſuperlatively ſmooth:
Th' uplifted Mallet with due Force came down;
Nor err'd the Chizzel in its fineſt Cut:
And th' Joint, where join'd, ſo curiouſly was wrought,
By Mortiſe, Tenon, Pin, exactly fram'd,
That it all human Art exceeded far.
Such was the Skill of him, who long e'er that,
Taught Wiſdom to the wiſeſt of meer Men;
And longer ſtill, e'er Man was made, made Earth,
Sun, Moon, and all thoſe glorious Orbs of Light:
Then Motion circular and central due
To each gave, as it ſuited his great Will;
That Angels wonder'd at the Work divine,
And all th' Hi'rarchy, all the Heavenly Hoſt
In ſweeteſt Notes, and moſt ecſtatic Strains,
To th' Eternal ſounded 'ternal Praiſe;
And ſung ſuch rapt'rous Songs as never reach'd,
But once, ſince *Adam* err'd, the human Ear.

FINIS.

ACADEMY, at *Wapping New-ſtairs*.

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